

RED ROCK LAKES NWR - NARRATIVE REPORT
1968

RED ROCK LAKES REFUGE

N
A
R
R
A
T
I
V
E

R
E
P
O
R
T

January 1 to December 31, 1968

U. S. Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

Monida, Montana

Monida, Montana

January 1, 1968

December 31, 1968

Owen H. VivionRefuge Manager
John T. AnnearWildlife Management Biologist
Katie L. HotchkissClerk Typist
Ray A. HotchkissHeavy Duty Mechanic
Clinton K. SearleWildlife Aid
(Temp. Assignment from Bear River Research Sta.)

Sam Breneman	Foreman	II
Henry Wetmore	Maintenance	man II
Michael Shafer	Maintenance	man II
John Rebar, Term. 7/16/68	Maintenance	man II
Joel Gleason	Maintenance	man I
Ken Heberling	Maintenance	man I
Dan J. Sullivan	Carpenter	

Bureau of Sport Fisheries and Wildlife

C O N T E N T S

	<u>Page</u>
I. General	
A. Weather Conditions.	1
B. Habitat Conditions.	3
1. Water	3
2. Food and Cover.	3
II. Wildlife	
A. Migratory Birds	6
B. Upland Game Birds	12
C. Big Game Animals.	12
D. Fur Animals, Predators, Rodents, and other Mammals.	14
E. Hawks, Eagles, Owls, Crows, Ravens, and Magpies	15
F. Other Birds	16
G. Fish.	16
H. Reptiles.	18
I. Disease	18
III. Refuge Development and Maintenance	
A. Physical Development.	19
B. Plantings	24
C. Collections and Receipts.	24
D. Control of Vegetation	24
E. Planned Burning	25
F. Fires	25
IV. Resource Management	
A. Grazing	26
B. Haying	26
C. Fur Harvest	26
D. Timber Removal.	26
E. Commercial Fishing.	27
F. Other Uses.	27
V. Field Investigation or Applied Research	
A. Progress Report	28
B.	30
C.	31
D.	32
E.	33
F.	34
G.	37
VI. Public Relations	
A. Recreational Uses	39
B. Refuge Visitors	39
C. Refuge Participation.	41
D. Hunting	43
E. Violations.	43
F. Safety.	43
VII. Other Items	
A. Items of Interest	45
B. Photographs	46
C. Signature	47

RED ROCK LAKES
NATIONAL WILDLIFE REFUGE

January 1 - December 31

1968

I GENERAL

A. Weather Conditions

Winter weather for the 1967 - 1968 season was normal with nothing unusual to report. The refuge area was snowbound and restricted to over-snow travel from late November to April 14 at which time a one way road was opened up to Monida. The season's snow pack was normal in depth and water content but was granular and did not pack. This caused over-snow travel to be difficult indeed.

Run-off from the snow pack began on April 27. Alternate freezing and thawing temperatures in late April and May allowed the snow water to develop slowly and most of it percolated into the soil. Consequently, our spring run-off was lighter than normal. Creeks showed "color" for about 10 days in early May and then were again clear. Water erosion was unusually light throughout the refuge area.

Summer weather departed markedly from normal. Rains had stopped by mid June, 3 weeks early, and the area was subjected to dry weather into mid August. A most unusual 4 inch rain fall was recorded in late August. Precipitation throughout the remainder of summer and fall was unusually heavy though well dispursed throughout the period. Late summer and fall precipitation broke all past records and the first permanent valley snow cover fell on November 1. The 1968 winter snowfall was early but not heavy.

Other than upsetting refuge work programs with unexpected wet conditions, weather caused no problems.

Weather effects on vegetative and wildlife production is presented in those sections of this report.

Chart I presents details of weather conditions as recorded at the headquarters official weather station for the 1968 calendar year. This station has now been equipped with a modern precipitation gauge. The new gauge is battery operated and punches out on coded tape every 15 minutes the amount of precipitation measured. It will eventually be tied in with our commercial telephone system so that the State Weather Bureau office may obtain precipitation data

WEATHER 1968

Month	Max.	Ave.	Min.	Ave.	Month Mean		Snowfall	Moisture	Normal	Diviation from Normal
January	45	22.3	-27	- 3	11		25.70	2.22	1.97	-0.25
February	44	28	-21	4	16		6.50	0.22	1.29	-1.07
March	54	37	- 9	11	24		12.40	1.41	1.50	-0.09
April	63	42	4	18	30		12.50	1.38	1.40	-0.02
May	69	54	17	29	41		9.00	2.04	2.55	-0.51
June	79	64	28	37	58	6/29	6.00	3.44	2.67	-0.77
July	84	78	32	42	60			0.01	1.18	-1.17
August	82	65	30	40	52			3.68	1.32	-2.36
September	77	64	22	32	48		4.0	0.47	1.50	-1.03
October	62	52	11	25	38		2.05	1.14	1.31	-0.17
November	43	32	-15	12	22		8.50	1.54	1.22	-0.32
December	41	26	-26	3	14		4.07	0.81	1.64	-0.83
Totals							90.72	18.36	19.55	-1.19
Extremes	84		-27				25.70	3.68	2.55	

CHART # 1.

at any time by simply dialing the gauge number. Automation has reached the "back country".

Ice-up of all refuge water areas began in late October and there was a complete ice cover by November 7 - about normal.

B. Habitat Conditions

Water

Chart II presents a summary of water levels recorded for Upper and Lower Red Rock and Swan Lakes for the season. These bodies of water are controlled by a single fixed structure located at the outlet of Lower Red Rock Lake.

Though light, spring run-off filled all refuge water areas to capacity. During July, water levels lowered normally but after mid August rose again causing a heavier than normal discharge downstream from the refuge.

Estimates (rough on two main flowages) indicate that some 101,112 acre feet of water other than sheet run-off and spring flows entered the refuge. Of this, approximately 22,061 acre feet were diverted for rangeland irrigation and wildlife habitat maintenance. Diverted water use is reported in detail in the 1968 "Record of Diverted Water Use Report".

Food and Cover

Grass and forb growth was retarded by cool temperatures during the early part of the season. Unusually warm temperatures in July coupled with good soil moisture brought about normal vegetative production. Late season rains produced good seed crops.

Aquatic vegetative production was normal. There is never a shortage of aquatic food - both animal and vegetal - on the refuge, though for about 5 months of each year it is locked under ice and unavailable to waterfowl.

Range conditions continue to improve under our range management program. It is encouraging to see the grasses respond so well - we're on the right track in this department.

Winter cover, though abundant, is not essential on the refuge. Most waterfowl, upland game birds and most big game species move out of the refuge area during our deep freeze season. Trumpeter Swan and Shiras Moose do remain and are amply provided for.

Swan Feeding

This winter activity was begun on November 18 as all but Culver and

WATER LEVELS

Gauge readings are possible only at the fixed outlet for Lower Red Rock Lake. This structure controls the water levels in Lower and Upper Red Rock Lakes, the interconnecting Red Rock River Marsh and Swan Lake. Structure flow line 6607'.

Structure frozen over at 6608.00' on November 27, 1967

April	11	6608.02'
May	4	6610.59'
June	4	6602.68'
July	5	6608.33'
August	8	6607.62'
September	10	6607.76'
October	11	6607.80'

Structure frozen over at 6607.70' on November 15, 1968

CHART # 2

MacDonald Ponds had been ice covered for nearly three weeks and most ducks had departed the area. Last year we changed to once a week feeding and are now experimenting with greater time lapses between feedings. We are proceeding cautiously with this feeding program change making sure that our charges are never without emergency feed. We know now that grain can remain in the water for a prolonged period of time without deterioration. With pond water temperatures in the low 40's grain neither sours or sprouts very fast nor does it appear to loose it palatability for swan feed.

II WILDLIFE

A. Migratory Birds

Trumpeter Swan

Last years record breaking trumpeter swan use-days remains unsurpassed. In 1968 only 88,711 use days were recorded, compared with 91,105 in 1967. This is a drop of some 2,394 days (3%) from 1967, and just 287 (3%) less than the 88,998 recorded in 1966. A decrease of 5,775 (18%) from 1967 is noted for the January-April period, and a drop of 476 use-days (13%) for the May-August period. The autumn (September-December) period shows an increase of 3,857 use-days, up 16% over the same period in 1967. The peak refuge population for the year was noted during the first week of July. This varies somewhat from last year when the peak was noted in the last week of August. Last years peak was 344, and this years quite similar; 348.

Trumpeter swan production was up quite markedly during 1968. In 1967 only 20 trumpeters were fledged on the refuge, and throughout the tri-state area only 45 cygnets survived to the flight stage. In contrast, 1968 found 90 cygnets on the refuge, and 154 cygnets fledged in the tri-state population. These figures point up, I feel, the vast difference spring precipitation makes in cygnet survival. In 1967, the hatching-rearing period was extremely damp; in 1968 it was dry.

Swan mortalities for 1968 which could be verified were few in number, but swan losses as indicated by census were more numerous. Reports from the GMA in Idaho indicated a loss of at least four trumpeters in the Island Park area; and within the refuge three carcasses were located. The largest number of cygnets counted on the refuge was 138 (July 15), yet by the first of September only 90 cygnets could be found within this same area. We picked up four cygnet carcasses during the course of our mortality studies, and we know of the loss of a single cygnet seen throughout the summer on Pintail Ditch. Construction of a Parshall flume necessitated turning off the water and it was three weeks before it could be turned on again. The cygnet couldn't wait.

Transfers - Ten cygnets were transferred to Hennepin County Park Department in Minneapolis. This brings the total number of trumpeters transferred to that area to 32. Two adults from this group were subsequently transferred to Sherburne National Wildlife Refuge, and three cygnets and one adult have died leaving a total of 26 trumpeters as the nucleus of another breeding flock. All ten of the cygnets shipped this year arrived in good

condition and to date all are in excellent health. To my knowledge this is the longest transport of trumpeter swans ever attempted via truck; a distance of approximately 1,100 miles. It can be induced from this experience that the trumpeter is actually a relatively hardy bird and travels quite well if conditions are right.

Fifteen adult trumpeters were transferred to various zoos and parks both in the United States and in Europe during late July and early August. Railway Express service has been discontinued (progress!!) between Butte, Montana and Salt Lake City, Utah. As a result it was necessary for Biologist Annear to truck these birds to Salt Lake (325 miles) to get them on the proper airline flight. One pair was shipped in care of Jean Delacour in France. This pair had a layover at the Bronx Zoo in New York, and while there the male died. A last minute rush resulted in the capture of one of the few remaining flightless swans on the refuge, and eventually the pair arrived safely at their final destination. Our Ambassador to Portugal requested that we present the Portuguese National Park Service with a pair of trumpeters. He assured us the State Department would handle all the details! Well, it would take six pages to describe the fiasco that resulted, but let it suffice to say that the Fish and Wildlife Service is considerably better equipped to handle swan transportation problems than is our State Department.

Whistling Swan

This species was seen on the refuge for only a short while this year. Several made a very brief stopover in the spring (mid March). Whistlers were seen again in the autumn (late October). Southward migrating whistlers were first seen on October 17, some ten days earlier than in 1967, and they had all departed by the 2nd of November (freeze-up), two weeks earlier than their departure in 1967. Last year, only 685 whistlers were noted during that period, but this year 1,700 (much nearer the norm) were counted on the refuge and contiguous areas. A five year record of use-days shows the following:

<u>Year</u>	<u>Days Use</u>	<u>Year</u>	<u>Days Use</u>
1965	25,920	1967	8,393
1966	38,920	1968	28,000

The areas of heaviest use this year were noted to be the entrance of the River-marsh and the egress area of Lower Lake. A great amount of use was observed on Blake slough just west of the refuge.

Geese

Goose use-days were down approximately 39% from 1967, and about 50% from 1966. Total use-days this year were 47,159 as compared

to 76,930 in 1967, and 93,849 in 1966. Peak numbers were recorded in the fourth week of October when 450 Canada geese were censused. In years past, the peak was noted in mid July when many honkers were using the refuge during their moult period. But this year very few geese were noted to be using the refuge during that period. A similar drop in molting population was noted on the Lima reservoir west of the refuge. In 1967, 8,000 honkers were censused on the reservoir and this year only 4,000 were counted.

Refuge goose production is quite similar to last year. Twelve broods (87 goslings) were counted this year as compared to 11 broods (100 goslings) last year.

As can be noted on the following use-days chart, refuge utilization by Canada geese seems to be on a downward trend over the past few years. It has been on the decline since 1959 when a record 210,000 use-days were noted. This years total was the lowest since 1953.

During the height of the severe weather occurring in mid August it was reported by a local resort owner that 35 snow geese were seen flying over Elk Lake, just east of the refuge. This has got to be some kind of a record for early arrivals since this species usually shows up about mid October.

Ducks

A total of 8,898,050 use-days were recorded for 1968, up 3% from a total of 8,626,898 use-days in 1967. Use-days for the first period were up from 1967, as were use-days for the second period, although third period use-days show a decline from the same period in 1967. First period totals for 1968 were up 14%, while second period use-days increased 33%. The decrease noted in the third period was 16% of the 1967 total. Duck populations recorded in the peak of fall migration are down from those recorded in 1967; 97,100 as compared to 112,710 last year.

As in years past, the three most populous species continue to be widgeon, mallard and scaup, in that order.

An unusual occurrence took place this year during the late summer period. The severe weather during mid August pushed many ducks into the refuge area for a period of a week and a half. Census revealed some 96,800 ducks on the refuge during the latter part of the stormy weather. This is just slightly below the numbers counted during the peak of the fall migration. Graph #2 showing the fall migration buildup of duck populations in 1968 as compared to the previous 5 year norm reveals this phenomenon in a more pictorial fashion.

Coots

This species was first observed on the refuge on March 29, two

SEVEN YEAR COMPARISON OF ANNUAL TRUMPETER SWAN, GOOSE
AND DUCK USE DAYS

RED ROCK LAKES NATIONAL WILDLIFE REFUGE

160,000

12,000,000

140,000

11,000,000

120,000

10,000,000

100,000

9,000,000

80,000

8,000,000

60,000

7,000,000

40,000

6,000,000

20,000

5,000,000

0

4,000,000

1968
1967
1966
1965
1964
1963
1962Trumpeter
Swan1968
1967
1966
1965
1964
1963
1962

Geese

1968
1967
1966
1965
1964
1963
1962

Ducks

C.O.

GRAPH
#2

EUGENE M. ZIGEN CO.
S. A.

NO. 340R-10 DIFF. GRAPH PAPER
10 X 10 INCH

Duck Population
(Thalassidroma)

100

90

80

70

60

50

40

30

1968

5 Year Mean

8-4

8-11

8-18

8-25

9-1

9-8

9-15

9-22

9-29

10-6

CENSUS WEEK

weeks later than their 1967 arrival date; and the last one departed for lands south on the 2nd of November. Peak population was recorded during the third week of September when 31,500 coots were counted. Total use-days for 1968 were 2,064,685, an increase of 20% over the 1967 total.

White Pelican

Refuge pelican populations seem to remain quite consistant from year to year. The norm falls between 350 and 400; this year the highest number counted during the summer was 390. Areas of heaviest use are Red Rock River near our lower control structure, and secondarily, the Upper Lake delta of Red Rock Creek.

Sandhill Crane

The first crane was seen on the refuge the 9th of April, and the last crane to leave in the fall was observed on the 4th of October. Sandhill cranes usually arrive in the Centennial Valley during the latter part of March and are first observed near Lima Reservoir. They normally arrive on the refuge about a week-and-a-half after their valley arrival date.

An aerial census in early August revealed 250 cranes on the refuge. 230 of these were adults and the remaining 20 were young. On the 16th of August our annual ground count was conducted. From ten stations strategically located about the refuge a total of 230 cranes were observed; 202 adults and 28 young. A detailed account of this ground count follows:

<u>Station</u>	<u>Birds Seen</u>		<u>Calls</u>	<u>Enroute</u>	
	<u>Adult</u>	<u>Young</u>		<u>Adult</u>	<u>Young</u>
1	4	1	1	2	
2	15	4		2	
3	5		2		
4	7	1	1		
5	5	1		4	
6	11	2	1		
7	9		2		
8	10	3	2		
9	4		1		
10	7	1	1	5	1
Totals	77	13	11	13	1

Estimated total for refuge 202 adults, 28 young - total 230.

Beginning this year and continuing into the future, both the ground count (to maintain previously accumulated trend data) and the aerial count will be used to determine the refuge population of sandhill

cranes. The following graph gives the trend of sandhill populations since 1961, when the ground count was initiated.

Great Blue Herons

The number of herons nesting on the refuge this year was estimated at 225 and during the annual rookery survey in mid August 69 young herons were counted.

B. Upland Game Birds

The southern portion of the refuge supports a population of both blue grouse and ruffed grouse. Estimates indicate that there are approximately 20-25 of the former and 75-80 of the latter species.

Sage grouse populations appear to be down from past years. An estimated population of 60 birds used the refuge this year and, in contrast to last year, were localized in units 14G and 15G. This species was noted just off the refuge during the last week of the year when six birds were observed.

C. Big Game

During 1967 few elk were sighted in the Centennial range but 1968 was quite different. This year sightings occurred throughout the summer months and during the migration period large groups were seen on various occasions. At one time 67 head were seen in one herd. We know for sure of two kills and have rumors of two others which took place during the hunting season. Shortly after the season opened heavy snows drove the animals off the refuge over into Idaho.

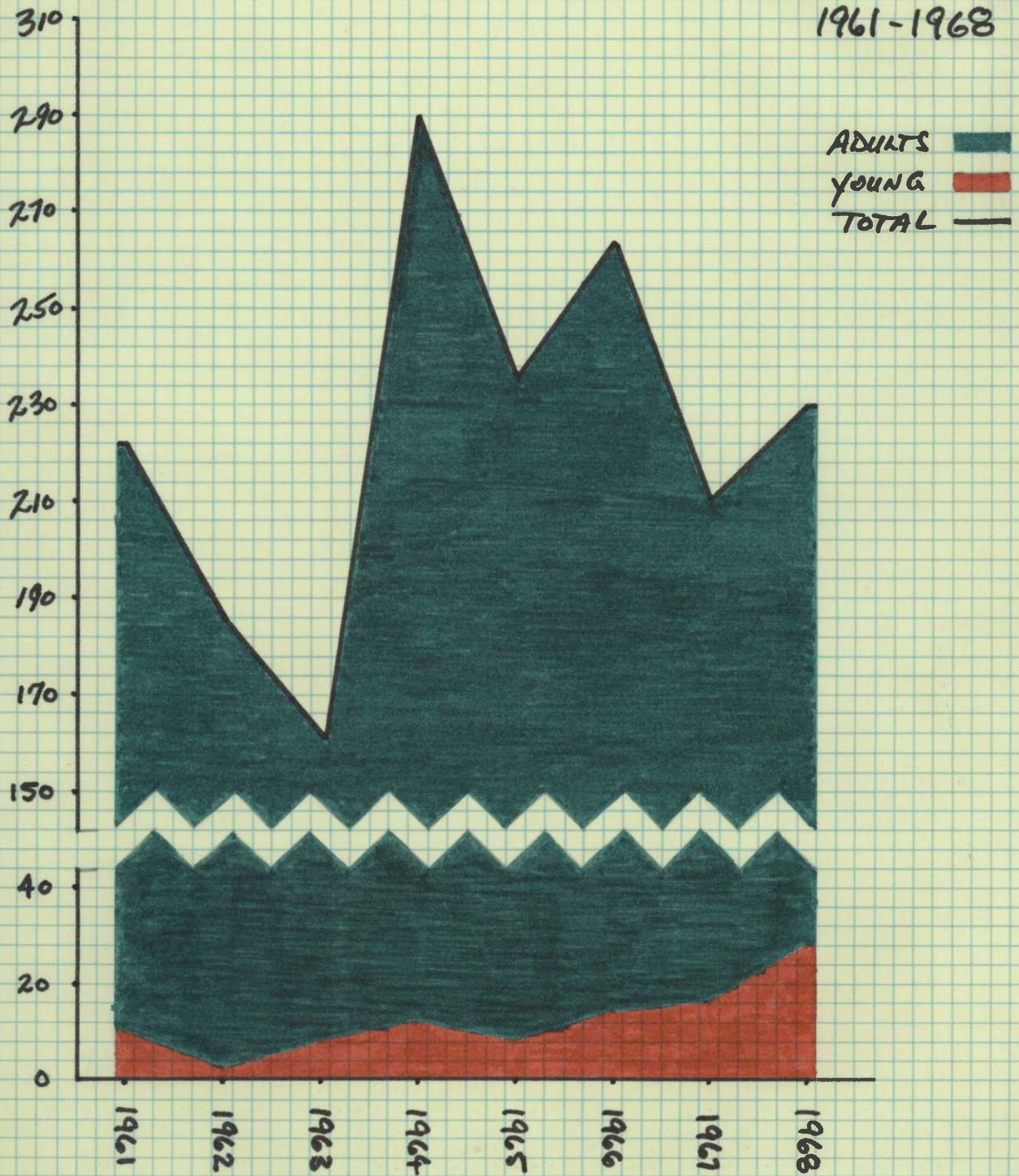
Mule deer use the refuge throughout the year, although the areas of use vary with the season. Winter use is restricted to the open slopes on the east end of the refuge, and during the remainder of the year deer are observed along the southern portion of the refuge. The deer population within the refuge never seems to grow very large, and as a result hunters find it not an easy task to find a target. During periods of peak use the refuge deer number in the neighborhood of 100 head.

Moose - During April a census conducted by Montana Fish and Game personnel revealed 40 head of moose within the refuge boundaries. Other aerial counts (July 2 and September 12) showed a population of 31 and 26, respectively. At year end an estimated 15 moose are still using the refuge. Calf production for the year amounted to 15, with one set of twins being observed.

Two moose banded in the vicinity of St Anthony, Idaho were observed on the refuge this summer. One was banded with a red neck collar and red ear tags, and the other with a yellow collar and ear tags.

SANDHILL CRANE POPULATIONS

1961-1968



At the present time, a research study project is being carried on at the refuge and some of the preliminary findings are summarized under section V Applied Research & Field Investigations.

Antelope numbers increased slightly this year. 325 animals were counted in mid August at the time of peak population. This total was broken down to 130 females, 65 males, 130 kids.

Antelope move on to the refuge as the snows are melting away, and remain until the first part of November when the snows again begin to push them into the lower valleys. Many of the animals have moved off the refuge by the opening day of hunting season and as a result few are taken within the refuge proper. Antelope can be seen throughout the refuge during the summer months but the peak of use occurs north of the river.

Bison - Bison were reported in the refuge area this year but none were observed on the refuge.

D. Fur Animals, Predators, Rodents & Others

The only predator control carried out within the refuge consists of a small amount of trapping during the winter months. We feel that the small number of animals taken at this time is sufficient to keep small mammals in balance with the waterfowl utilizing the refuge. We know that predation on waterfowl takes place, but we feel that it is of such an insignificant quantity that no plans are being made to initiate more extensive predator control.

Muskrat numbers still appear to be on the increase, but only by a small percentage of last years population. An aerial house count is conducted just subsequent to the first permanent snow and population estimates are based upon this census. The accuracy of our count is not sufficient to give a sound basis for total population, but does present valuable trend data. Vast unopened beds of emergent vegetation indicates that much habitat remains unused by muskrats. The species is not trapped on the refuge due to their value in providing nesting platforms for trumpeter swans. However, on occasion, rats get caught in sets placed for mink, one of the major rat predators.

Beaver - Except for a few nuisance animals, beaver trapping within the refuge is negligible. Beaver were heavily trapped and their dams removed for many years to enhance grayling spawning, but this seemed to have little effect. For the past four years beaver control has been minimal and restricted to animals blocking and diverting irrigation water.

Most serious trapping on the refuge is oriented toward mink. They feed on waterfowl eggs and are a major predator of muskrats. As a result, our trapper is unlimited as to the numbers of mink he may

take. Weather conditions normally account for the fact that few mink are removed.

Fox populations are on an upward trend, but the numbers are not yet of sufficient magnitude to become concerned about, since a major poisoning effort some years ago virtually eliminated the population.

Coyotes were nearly eliminated by poisoning and shooting many years ago and today only an occasional sighting occurs.

Bobcat - A female bobcat and four kittens were seen crossing the road near the campground in mid September. This is a rare occurrence as it is more normal for this species to be higher in the hills at that time of year.

Wolverine - During the 1966 and 1967 winter season our trapper found one of his traps containing three toes which he felt were from a black bear cub. During the 1967 and 1968 winter a local rancher shot a wolverine just east of the refuge and he noticed ... it had three toes missing! It now appears that this species is on the increase in this general area. The rancher stated he has seen three others, and near Virginia City, Montana a wolverine was trapped in January. The Chief Naturalist of Grand Teton National Park (just over the mountain from us) reports three sightings this summer; the first in the past 14 years.

Ground squirrel populations were normal and sufficiently small to cause no problems.

E. Hawks, Eagles, Owls, Crows, Ravens & Magpies

Red-tailed, roughleg, and Swainsons hawks are commonly seen during the summer season, and again this year red-tailed hawks nested near Culver Pond. Peregrine and prairie falcons were seen near the south side of the refuge and it is thought, though no evidence has verified it, that both species nest on the refuge.

Sparrow hawks are quite common throughout the refuge through the summer season, and during migration about 150 were seen.

Southward migrating bald eagles use the refuge as a stopover point, but this year were down by about 50% from last year. Where in 1967 one could count 26, only 12 were observed in 1968. At other times during the year an occasional one or two were seen on or near the refuge. No known nests are in this vicinity hence little use is made of the refuge during that period of the year.

Golden eagles are seen throughout the year, but never in large numbers. Summer populations usually number below 6, and during migration 10 to 12 can be seen.

Great horned owl numbers seem to vary little from one year to the next; remaining quite stable. Residents and visitors to headquarters often hear these great birds calling in the early evening hours.

Usually autumn raven migration finds 10 to 15 birds using the refuge, but this year the numbers doubled and an estimated 30 birds passed through the refuge.

F. Other Birds

The severe storm in mid August caused many of the songbirds to flock-up as though in preparation for their southward journey. The weather broke eventually and all birds returned to normal. Many were still with us past the first of November.

This same storm deposited twenty cedar waxwings "on our doorstep". On the 15th of August these birds were observed in the headquarters area, where they remained until the 20th. This is apparently the earliest sighting of this species in refuge history. They are most often observed in late fall (December) while on migration.

Mountain bluebirds frequent the south portions of the refuge during the spring-fall period in unusually large numbers. The Centennial Valley supports one of the heaviest concentrations of bluebirds to be found anywhere according to most ornithologists who visit the area.

They are successful breeders in the area in spite of heavy competition for nesting sites from swallows. Frequently bluebirds will use artificial nest boxes but usually lose out to the swallows. Biologist Annear put up a new bird house this spring that was immediately accepted by a pair of bluebirds. Two clutches of bluebirds were fledged from that house this year. Other similar houses went unused by either swallows or bluebirds.

Two feeding stations provided by Vivion and Hotchkiss received heavy use by a wide variety of birds throughout the season. Hotchkiss is especially adept in luring in western tanagers. Cassins finches come in large flocks to both feeders.

On the following page is a representation of our refuge first-arrival bird list.

G. Fish

Four and five pound trout were commonly seen being lifted from refuge waters this summer. More common, of course, were many smaller size fish, but the refuge does provide excellent fishing. Whether in the ponds or streams, the fish are there, it is just a matter of outwitting them. Brook and rainbow trout account for the large

Spring Bird Sightings 1968

1/11	Song Sparrow	4/25	Long-billed Curlew
1/11	Hairy Woodpecker	4/25	Peregrine Falcon
2/23	Horned Lark	4/29	Townsend's Solitary
2/24	Starling	4/29	Lewis Woodpecker
2/29	Red-winged Blackbirds	4/29	Goshawk
3/1	Junco	5/2	Vesper Sparrow
3/12	Red Crossbill	5/2	Tree Sparrow
3/24	Bluebird	5/6	White Pelican
3/25	Clark's Nutcracker	5/6	Willet
3/25	Red-shafted Flicker	5/6	Spotted Sandpiper
3/25	Meadowlark	5/6	California Gull
3/29	Coot	5/7	Audubon's Warbler
3/29	Robin	5/7	Chipping Sparrow
3/29	Chickadees	5/7	Wilson's Phalarope
3/30	Cassin's Finch	5/7	Cowbird
4/2	Swainson's Hawk	5/7	Avocet
4/2	Red-tailed Hawk	5/19	Pied-billed Grebe
4/2	Northern Shrike	5/19	Western Grebe
4/6	Sparrow Hawk	6/4	Western Kingbird
4/9	Sandhill Crane	6/6	Goldfinch
4/10	Tree Swallow	6/6	Grosbeak
4/17	Yellow-headed Blackbird	6/14	Yellow Warbler
4/18	Rough-legged Hawk	7/1	Rufous Hummingbird
4/20	White-crown Sparrow		

majority of fish taken, but cutthroat and grayling also show up in the creel. Fisheremen continue to increase in numbers, but the number of large fish taken does not seem to wane. If fishing pressure continues to increase we may be required to consider some type of a stocking program. Although we are now striving to maintain a native fish population.

There was a noticeable increase in the number of grayling, fish of all sizes, taken from Culver Pond this year. Grayling were planted in this pond in the 1950's but few had ever shown in the creel before this season. We have an explanation for this gratifying event but are not yet ready to stick our necks out with a flat statement. It does appear that perhaps manipulation of irrigation water dumped into Culver Pond for the past two years may have provided the grayling with a suitable spawning area free from brook trout. Time will tell if this is a fact or fancy.

H. Reptiles

Reptiles are rare on the refuge as they are throughout the Centennial Valley. The severe winters seem to preclude any but the hardiest of species surviving. We do see, on occasion, a tiny lizard or snake slithering through the vegetation.

I. Disease

No disease was noted in any refuge wildlife other than that mentioned in the trumpeter swan section of this report.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. New Construction

Fences

With Expense of Sales monies, about 2.5 miles of new interior livestock control fence were built. The marsh-willow portion of grazing unit 10 was separated from the uplands to reduce grazing pressure on the latter. Nearly 1,200 AUM's of grazing are possible in the marsh-willow section but cattle had not been willing to go in the area. With the new fence we were able to graze the wet area through the entire season and the cattle did well.

The fence is 3 barbed wire with steel posts every 16 feet and stays between. No cattle crossed it this summer.

Water Measuring

A 5 foot wide concrete Parshall Flume was built, in accordance with specification 1R Mont 177 60.0 provided by engineering, in Mallard Canal some 150 yards downstream from the Culver Pond diversion. This will give accurate measurement of Culver Pond waters diverted into grazing units 13 and 15.

Roads

The public access road from the south east corner of the refuge (Red Rock Pass Road) around Culver Pond and on to the Elk Lake Road was completed. This is a 22 foot wide road bed, well crowned and graveled where necessary. The new road has proven its merit - instead of 50 stuck visitors as normal for a season we encountered only one this year. That one had tried to drive a Volkswagon across a swamp well off the roadway.

Signs

Three information signs (see photo section) were acquired through the US Forest Service sign shop and installed at the three entrances to the refuge public fishing area. The signs have proven to be attractive and beneficial in control of public use of the area. The necessity of patrol activities to prevent undesired activity in the area was greatly reduced.

2. Rehabilitation

Fences

Some 0.25 mile of new fence was placed in the MacDonald-Widgeon Ponds

area of 13G replacing 1.5 miles of old and badly deteriorated livestock control fence. This shortened fencing has greatly improved the appearance of the area around these two ponds and gives better control of cattle.

Three tenths of a mile of jack-leg fence on the south side of grazing unit 13 and 0.25 mile on the south side of grazing unit 2 were replaced with new steel post fencing.

Three steel cattle guard road crossings were installed.

Buildings

Electrical wiring in the office-service building, headquarters barn, and quarters 90 will be brought up to electrical code under contract. All wiring in the office-service building and headquarters barn will have to be replaced. Wall outlets and exterior cut-off switches are to be installed in quarters 90, 94 and 110. The electricians had started wiring in the office-service building but due to snow conditions could not come back into the valley to finish the job till spring.

Well water was brought into the office-service building eliminating the old contaminated creek water system.

Dams

Culver and Widgeon Ponds were provided with emergency spillways.

Springs

The spring at Upper Lake Campground was found to show frequent, though light contamination. The spring head was redeveloped to Public Health Service standards and now produces about 50 gallons per minute of pure water.

Radio System

Our old radio system was replaced. Two 90 watt mobile units, one 2 watt handi-talkie and a 60 watt base station with a 60 db antenna were purchased from Motorela Corp. Yellowstone National Park radio technicians installed the equipment on a reimbursable basis. Our broadcast frequency was changed to 170.050 mh; hopefully, to give us better reception in all areas.

We now have reliable communication from beyond Red Rock Pass to the east, to the top of Monida hill to the west. In other words, we can communicate from any point in the Centennial Valley and Alaska basin. Through rental of a battery pack radio from Yellowstone Park we also have radio contact with park headquarters in Mammoth,

Wyoming through Yellowstone National Park Service relay station on Mount Washburn. This provides us with emergency communication to the outside world during the winter months. No more "smoke signals".

Irrigation Systems

Shambow Creek: Approximately 0.70 mile of spreader ditch was cleaned and reactivated.

O'dell Creek Diversion: Approximately .50 mile of supply canal was rebuilt. This system's supply canal is now complete from the point of take out from O'dell Creek to the spreader system in grazing unit 5. Control or water division facilities in the canal are all installed. Additional spreader ditches and a take out facility remain to be rehabilitated before the system is complete.

Tom Creek: All water control facilities are now installed in this system and that part of the system in grazing unit 10 is complete. One more diversion from Tom Creek into the south side of grazing unit 12 remains to be rebuilt.

Still more irrigation system rehabilitation work remains to be done. But we are progressing, and each year sees more water spreading for wildlife habitat development and range land irrigation. And our water rights are more secure.

In deference to our budget and need for getting the irrigation systems operable, we have used numerous low cost wooden water control facilities. As these deteriorate or money is made available, they will be replaced with steel structures. From this point on, all new control facilities will be of steel or concrete.

Red Rock Creek: Red Rock Creek was rediverted into its old channel downstream from the Elk Lake Road last year. This year, all cutbank's and other areas showing signs of erosion were rip-rapped with slide rock obtained from the US Forest Service (see photo section). As time goes on, more rip-rapping will be required as new points of erosion develop. We feel that the major portion of this age old erosion problem is now corrected and without the problems incurred by channel straightening. In addition, nearly three miles of stream are available for spawning and public fishing.

In this project about 2,600 linear feet of creek bank were rip-rapped with an estimated 1,000 cubic yards of slide rock.

Maintenance

Buildings: Wet weather during our normally dry season forced us to postpone painting of quarters 94, 110 and cow camp. No major building maintenance was accomplished.

The basements of Quarters 1 and 90 were repainted.

All septic tanks were cleaned and the systems reactivated with Formula MC101.

Fences: Numerous fence repairs were accomplished on force account and grazing permittees. During late fall, the refuge crew went over the entire north and east boundary fence making repairs as they went. This part of our boundary is secure for a few more years.

Structures: All structures and fish screens were cleaned as necessary. Snap tie holes and cracks in all concrete structures were cleaned and cemented over. All signs of erosion around structures were rip-rapped with slide rock.

Ponds: The banks around Buck Pond had settled more than was anticipated so we draglined an additional 2 feet to 3 feet elevation to this dike. Sod was laid at the water line to encourage vegetative protection from water erosion.

Equipment: Fewer breakdowns to summer work equipment were encountered this year. One new unit, a 5 cubic yard International Dump Truck, did suffer though. This unit tore out the distributor and transmission in the first 600 miles of operation. Both problems were due to improper factory installation and caused the unit to be laid up about half the work season. Repairs were made through warrantee.

Air boat: The new "second hand" 125 hp Continental aircraft motor was installed on the air boat as a pusher unit with electric starting. The boat performance is outstanding and much SAFER.

The Kristi KT6 snow cat, purchased new in November 1967, gave poor service and proved to be unreliable. It's basic problem seemed to be metal fatigue caused by excess track vibration that could not be corrected. We have learned from other sources that this is a common problem with all Kristi snowcats. In 131.5 hours of operation the unit had required \$1,500 worth of repair and was completely inoperable at the end of the winter season. An attempt is being made to persuade the company to take the unit back as it did not satisfy GSA contract guarantees. A complete report on the performance of this unit is on file in Regional Office.

Bombardier: The 8 passenger Bombardier acquired from surplus sources several years ago was reworked. A new motor was installed along with numerous other parts. The unit is old and some parts are obsolete and difficult to obtain. We feel that the unit will give us satisfactory transportation to the "outside" world as long as the road is well packed.

Hough loader: The motor for this unit was rebuilt last winter. The

unit performed satisfactorily with no time consuming breakdowns this season.

Grader: Our 212 Cat grader suffered its usual breakdown frequency. We were fortunate to obtain through surplus an Austin-Weston 4 wheel drive grader that seems to be in good condition. This unit will be especially valuable in cleaning our irrigation water distribution systems and will take a lot of pressure off our old 212.

John Deer: The John Deer track layer is in need of a complete new track and clutch assembly and several other miscellaneous parts. We are trying to replace it with a better unit but hate to see "Johnny Pop" go.

Biologist' jeep: An observation platform was built on top of the jeep cab. It's equipped with a collapsable guardrail and is handy for making observations and carrying bulky items.

Surplus

The following is a summary of units disposed of through surplus this year:

<u>No.</u>	<u>Units</u>	<u>Transferred</u>
1	Dodge $\frac{1}{2}$ ton 4 x 4	Montana School System
2	2 $\frac{1}{2}$ cu. yd. Dump Truck	1-US Geological Survey, and 1 Private
3	Studebaker World War II Weasels	Bureau of Indian Affairs
	Weasel Parts	US Geological Survey, Alaska
	Weasel Parts	Bureau of Indian Affairs, Blackfoot Agency
1	Chatlin Flatbottom Ditcher	Bureau of Indian Affairs, Fort Belknap Agency
1	Snowplane (165 Kinner Aircraft Motor)	Private
1	Forklift	Eagle Creek Fish Hatchery

Units - Acquired through surplus:

- 1 Austin-Weston Grader, 4 wheel drive, all wheels steerable.
- 1 Secretary Model Thermofax copier.
- Miscellaneous pipe and fittings.

We worked with a reduced force this summer and most activity was located some 20 to 30 miles out from headquarters. This created slow progress.

Our forman-heavy duty equipment operator was off nearly half the summer taking care of his ranching operation in the valley. One maintenanceman was discharged just before the "hiring freeze" and wasn't replaced. We had no student trainee. So, we worked with three maintenancemen the full summer and one equipment operator half the summer.

Visitors

Refuge visitors required practically no mechanical repairs or assistance in getting out of the mud this season. The new access road in the public fishing area reduced the usual number of stuck vehicles.

Beautification

General clean-up of the refuge was continued though manpower and budgetary restrictions limited the amount we were able to accomplish. Much remains to be done.

B. Plantings

1. Aquatic and Marsh Plants.
Nothing to report.
2. Trees and Shrubs
Nothing to report.
3. Upland Herbaceous Plants
Nothing to report.
4. Upland Crops
None grown at this station.

C. Collections

1. Seeds and Propagules
Nothing to report.
2. Specimens
See applied research - swan mortality study.

D. Control of Vegetation

There was no chemical control of vegetation on the refuge. Several patches of Canada thistle (c. arvense) were hand cut to remove flowering heads.

E. Planned Burning

Nothing to report.

F. Fires

None to report. The burning index in the area remained low all season and there were no dry-lightening storms in the area.

IV RESOURCE MANAGEMENT

A. Grazing

Cool spring weather and an early cut-off of rains threatened us with a poor grass year. Unusually warm weather in July and good ground moisture did produce good late season grass growth however. Frequent rains from mid August on maintained excellent soil moisture and produced good grass and seed crops.

Further reduction of grazing pressure coupled with increased water spreading are improving range conditions rapidly. Cooperation from grazing permittees has been excellent, and, we and our Senators have heard no "gripes".

A total of 4,551 head of cattle, excluding calves under 6 months of age, grazed 13,395.90 AUM's under 20 permits on 27,320 acres of the refuge. Three head of horses grazed 18.35 AUM's under one permit on 95 acres. Grazing rates remained at \$2.00 per AUM for both horses and cattle returning a cash revenue of \$24,837.94 to the Government.

B. Haying

Two haying permits were issued for 253.80 tons of hay from about 460 acres. Haying rates remain \$7.00 per dry ton returning \$1,776.60 to the Government.

C. Fur Harvest

One trapping permit for the 1967-68 season was in effect this period. After January 1, 1968 the trapper removed 30 mink, 46 muskrats, 10 badgers, 142 skunks, 16 bobcats, 24 fox, 7 white weasels, 7 beaver, 1 lynx.

We received one response to two advertisements placed in local newspapers for trappers for the 1968-69 season. Hence, our one trapping permit was issued to Mr. Lincoln Miller, Monida, Montana our mailman and the only applicant. We have followed all requirements in selection of our trapping permittee this year.

To December 31, 1968 Mr. Miller had taken 19 mink, 3 bobcats, 1 lynx, 18 fox, 136 skunks, 17 muskrats, 1 weasel, 7 badgers, 7 beaver.

D. Timber Removal

Nothing to report. Bureau of Land Management has begun timber removal in the Centennial Mountains to the west of the refuge. This timber is being cut for pulp wood as it has low value for

lumber. The loggers had anticipated working all winter but were forced to quit early in November by snow cover and deep snow.

E. Commercial Fishing

None on the refuge.

F. Other Uses

The Red Rock Cattlemens Association rented the MacDonald Cabin in accordance with the original agreement. They paid \$35.00 rent for the 3 month grazing season.

Idlewild, Butana, and Daniels Hunt Clubs rented the three club facilities on the shores of Lower Red Rock Lake for a total rental of \$120.00 for the year. These three clubs have appealed closure of the facilities to the Secretary of the Interior and their appeal has been denied. The facilities (all government owned) are scheduled for final closure December 31, 1969.

V FIELD INVESTIGATION & APPLIED RESEARCH

A. Trumpeter Swan Nesting Study WMS-41

Sixty nests were recorded this year during the trumpeter swan nesting study. This is the same number of nests located in 1966, and compares with the total of 53 found in 1967. Fifteen of the nests were located on the same nesting site used the previous year, and 33 were located within the same territory but on a different site than that used in 1967. Twelve nests were located in territories which went unused in 1967, and of these new locations, 4 might be considered to be marginal nesting habitat.

Two territories were established on areas which were man-created habitat improvements. One was located on Buck-Rail Pond, and the other on Pintail Ditch. This brings to a total of four the number of nesting territories as a direct result of habitat improvements.

Noted below are the nest locations in accordance with the biological units:

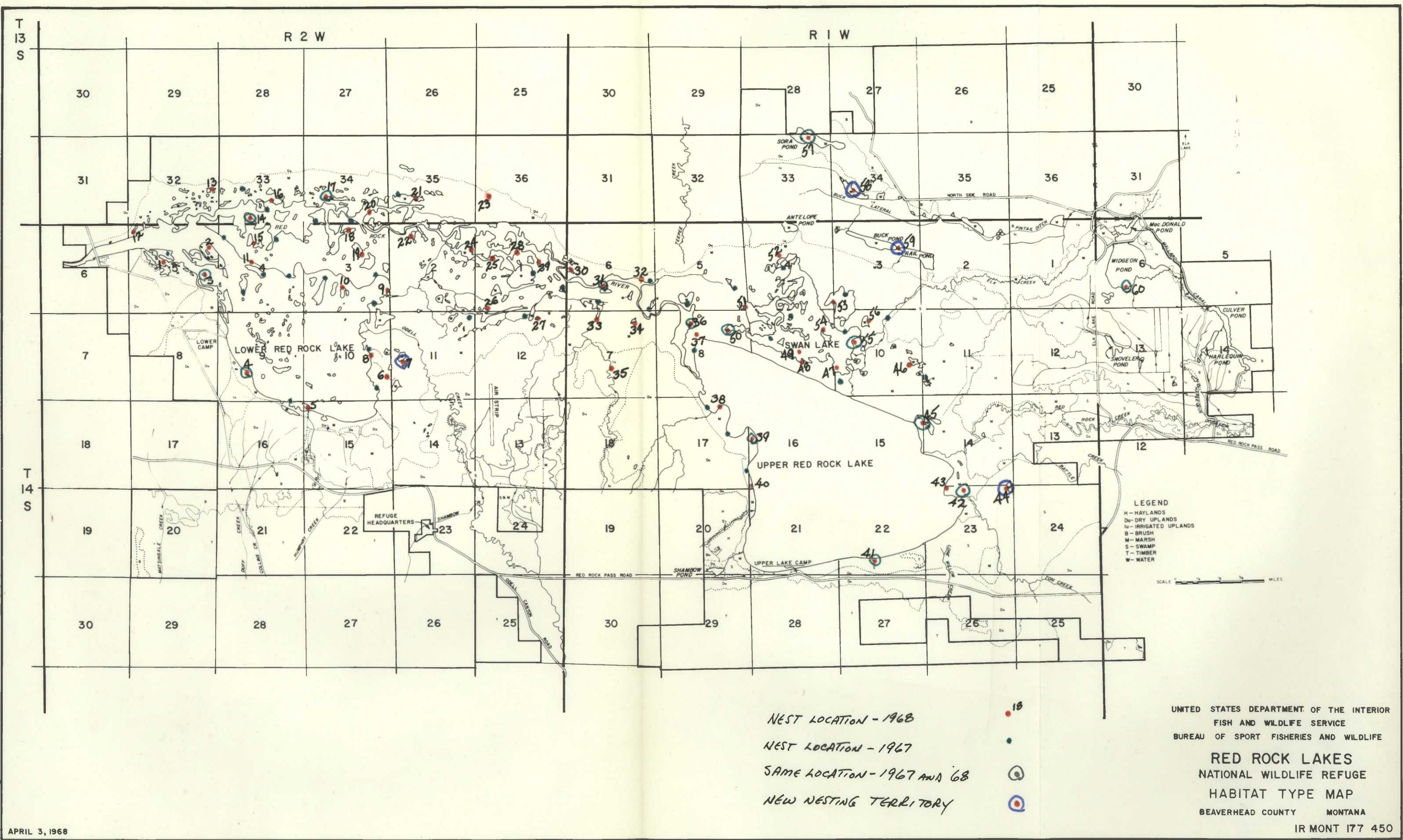
<u>Unit</u>	<u>Nests</u>	<u>Unit</u>	<u>Nests</u>
Lower Lake	11 (13)*	Swan Lake	11 (10)*
River-marsh	25 (19)*	Ponds	2 (4)*
Upper Lake	9 (9)*		

* The parenthesized figure represents 1967 figure.

Nesting activities were first noted on the 29th of April, when an aerial census revealed birds constructing and occupying nests on the east shore of Upper Lake (#42) and on Widgeon Pond (#60). Incubation was well underway by the 17th of May, and the first broods were noted on Widgeon Pond (June 16), and on Sora Pond (#57) (June 17).

Three nests (#'s 19, 23, 40) were constructed and inhabited, but apparently no egg-laying took place. The nest on Buck Pond (#59) contained five eggs but seemed to be abandoned prior to incubation; examination of the eggs revealed no development. Other nests (note Hatching Success Study) contained only one or two eggs. These events would seem to indicate that we may be seeing early nesting attempts by mature, but younger birds, just beginning their breeding activities.

Fifteen nests were located off the refuge in the Centennial Valley. Elk and Conklin Lakes had one each, and thirteen were located in the valley downstream from the refuge. A total of 29 cygnets was fledged from these nests.



The Elk Lake nest is located at the upper end of the lake, and from mid summer until freeze-up another pair of swans took up residence on the lower end of the lake. It will be of interest to note whether this new pair makes an attempt to nest, and if so, what effect it will have on the established pair.

The nest on Conklin Lake was located near the boat dock, about fifty yards from the cabin. Three eggs were observed in the nest in late May, but in early June a range rider moved into the cabin. Apparently the swans were disturbed a sufficient amount to cause them to abort the incubation attempt. The pair was last seen on the lake June 14th, and not again throughout the summer.

B. Hatching Success Study

Of the sixty trumpeter swan nests located on the refuge, 30 were randomly selected for inspection to aid in determination of trumpeter swan cygnets hatching and survival success studies. An attempt was made to select 50% of the nests in each biological unit for sampling. The results of the pre-hatch inspection are as follows:

<u>Unit</u>	<u>Nest Checked</u>	<u>Eggs Found</u>	<u>Eggs per Nest</u>
Lower Lake	8	38	4.75
River-Marsh	12	58	4.83
Swan Lake	5	25	5.00
Upper Lake	5	20	4.00
Ponds	3	14	4.6
Totals	33	155	4.696

The total of 4.696 eggs per nest compares with 5.3 in 1966, and 3.4 in 1967. On checking the nests it was noted that of the 33 inspected only three contained as few as two or one egg. Five nests contained six eggs, and one nest on the river-marsh (#31) contained eight eggs, all of which hatched.

When the total eggs per nest is multiplied by the sixty nests on the refuge the result is a theoretical total of 282 (281.76) eggs produced.

Then we conducted a post-hatch inspection and found:

<u>Unit</u>	<u>Eggs Layed</u>	<u>Eggs Remaining (unhatched)</u>	<u>Sample Hatching Success (%)</u>
Lower Lake	38	4	89.5
River-Marsh	58	13	77.6
Swan Lake	25	7	72.0
Upper Lake	20	5	75.0
Ponds	14	5	64.3
Totals	155	34	78.06

The 78.06 compares with a quite similar figure of 74.4 in 1966, and a low 56.9 in 1967.

When the total sample hatching success is applied to the theoretical number of eggs produced it appears that 220 (219.9) cygnets should have been the result, but the highest number of cygnets actually counted on the refuge was only 138, indicating an overall hatching success of 48.9%.

Since only 90 of the cygnets survived to flight stage, this would indicate an actual survival rate of only 65.2%, and an overall hatching-survival rate of 31.9% of the theoretical maximum. Contrast these percentages with those of last year: 55% and 11%, respectively.

Tabulated below are the results of biweekly cygnet count flights made this past summer:

<u>Date</u>	<u>Upper Lake</u>	<u>Swan Lake</u>	<u>River Marsh</u>	<u>Lower Lake</u>	<u>Ponds</u>	<u>Total</u>
7/2	10	28	42	20	8	108
7/15	16	24	57	34	7	138
8/1	16	23	47	37	7	130
8/15	Cancelled due to weather conditions					
8/26	5	17	41	18	7	90

Unlike the previous few years, the greatest losses of cygnets occurred this year on the Upper Lake and the Lower Lake. The most severe losses seemed to occur during the mid August period of extremely heavy rainfall. The cygnets population on Lower Lake dropped by 52% and on Upper Lake by 69% during this period.

Twelve of the 90 cygnets were transferred to other areas in mid September; two to Portugal and ten to Minneapolis, Minnesota.

C. Trumpeter Swan Mortality Study WMS #2

No student was assigned to this study project in 1967, but this past summer Mr. Clinton Searles, a microbiology student from Weber State College was in residence on the refuge. He conducted cygnet survival studies and preliminary microbial analysis of various waterfowl specimens obtained on the refuge. He kept a running tally on the number of cygnets in 25 territories. When a cygnet was observed to be missing from a brood a search was undertaken; but for all our efforts only four swan cygnet carcasses were recovered.

Approximately 20 ducks, 5 grebes, and one pelican were also recovered and subjected to microbiological examination. In connection with this study, blood samples were taken from 12 adult

trumpeters at the Bear River Research Station while they were enroute to Salt Lake City for transshipment to various zoos. The results of all laboratory tests have not been revealed to date, but a full report of the years activities will be submitted in the near future. 1968 was one of the better production and survival years in recent history and provided minimal opportunities for acquisition of cygnet carcasses, but the plans are to continue this study until some definite results are found and recommendations can be made.

A note of interest which is indirectly related to this study was the results of analysis of three swan carcasses autopsied at Hennepin County, Minnesota. They had been transferred to reestablish a new breeding flock, but died three days after arrival. Examination of the carcasses revealed minute amounts of DDT derivative present. Park officials assure us that the birds were quarantined there and could not have been subjected to any source of contamination. We have no knowledge of any use of chemicals in the vicinity of the refuge from which these contaminants could have resulted, but it has been suggested that one source may be airborne particles from the extensive agricultural areas to the south of us in Idaho.

D. Trumpeter Swan Banding

Sixty nine trumpeter swans were captured and banded this year by the refuge biologist. Fifteen of these swans were shipped to various zoos, ten were transferred to Hennepin County, Minnesota, and the remaining 44 were released at point of capture.

A most interesting band return was found this year. On July 3rd, during the banding operation a swan was captured and was found to be wearing a band numbered 509-55067. This bird had been banded as an adult back in 1956, some thirteen years ago.

Another band return recorded this year was one found on the Missouri River near Great Falls, Montana. It turned out that this bird was one of a pair which escaped from the Great Falls zoo in 1966. Apparently the pair had remained in the area since, as we have had recent reports of swan sightings in that area which is approximately 250 miles north of what we consider the extent of the tristate breeding population. We had hopes that this pair might set up a nesting territory somewhere in that vicinity, but the loss of this male rules that out. A Montana State Game Warden recovered a crippled trumpeter near Ryegate, Montana which is north of Billings. This is nearly 125 miles northeast of the areas normally known to be inhabited by trumpeter swans. This bird was banded on the refuge in 1967 as an adult.

E. Trumpeter Swan Neck Banding Study

Reported sighting of trumpeter swans wearing colored neck collars this past year were numerous within the Centennial Valley, but outside this area only five sightings were reported. Island Park area accounts for three sightings, Ennis Lake and West Yellowstone one each. Neck collared swans were seen throughout the year in the Centennial Valley, and numbers observed ranged from one green band to 11 red bands and three green bands. This latter sighting occurred on March 11. On January 12, nine red bands and two green bands the largest group of banded swans seen outside the valley, were sighted on the Island Park Reservoir. The largest number of bands observed on a single day was recorded on March 11th when 20 banded birds were sighted throughout the tristate area.

Within the refuge we know of three pairs of nesting swans contained a bird wearing a neck band. One male (red) and two females (green) were observed on territories during the nesting season.

Of special interest is the situation wherein we had a pair of neck banded swans set up a territory in 1967. This territory was located in a marginal habitat, and no eggs were ever observed on the nest. The territory was abandoned about mid June of that year. In 1968 a pair of neck banded swans were observed on the Bar N Ranch, 5 miles west of West Yellowstone, Montana (45 miles east of the refuge). They nested on a farm pond and were seen with four cygnets on September 6. Whether or not this was the same pair which was so unsuccessful on the refuge the previous year we are unable to determine; but it appears likely they may be, since these are the only two instances of a pair of neck banded birds displaying breeding behaviour.

The above observation seems to indicate that the neck collars do not completely inhibit breeding activities, but at the same time we have no way of knowing how many swans might make an attempt were it not for the collars.

F. National Trumpeter Swan Survey

The following is a brief summation of the 1968 Survey Report which was submitted in September.

A record total of 907 trumpeter swans were tallied in the 1968 Annual Census, the largest number counted since formal censusing began 37 years ago. The 907 total includes 206 cygnets, the second highest production ever recorded. Nine cygnets were produced in two zoos, with three others reporting successful nesting and hatching efforts, but failure in raising the cygnets.

A comparison of the results of the past three annual surveys reveals

the following:

<u>Year</u>	<u>Adults</u>	<u>Cygnets</u>	<u>Total</u>
1966	713	165	878
1967	701	93	794
1968	701	206	907

The following two pages are extracted from the Annual Survey Report. The first is a tabulation of trumpeter swans by states for the past three years, and the second is a record of the trumpeter swan population since the survey was initiated in 1932.

It can be noted on the first insert that total cygnet production is 206, more than double that of 1967, and in addition, there were nearly as many cygnets fledged on the refuge alone in 1968 as on all areas combined last year. On the second insert one item of interest is the fact that while the total trumpeter population has been steadily increasing over the past 37 years, the cygnet production has remained relatively stable for (with one or two exceptions) the last twenty years; the average for that period being 111 cygnets per year.

While titled the "National Trumpeter Swan Survey" this survey does not include information on the population in Alaska, nor does it include the flock in Canada. We are presently attempting to include this data in our 1969 survey and hope that we can title that one the "North American Trumpeter Swan Survey".

This survey is just that; a survey, and not a total nose-count. This was pointed out to us quite emphatically this past winter. In the 1967 survey we counted only 45 cygnets on the aerial coverage of the tristate area. On the mid winter Waterfowl Census (January 12, 1968) we counted twelve cygnets on the refuge, and 70 cygnets on Island Park Reservoir, 20 miles south of the refuge.

G. Aquatic Survey

Aquatic surveys conducted on the Red Rock Lakes Refuge are modeled after Webster's (with modifications suggested by Ekedahl) random sampling techniques. In addition, we have gone one step farther and, through a little mathematical magic, have derived two projected figures; one, for the tonnage of vegetation produced per acre, and two, the total tonnage of vegetation produced in the body of water being surveyed.

Plans were made to survey half of the water areas on the refuge during 1968, but due to the extremely inclement weather during mid August only two, rather than four, of the areas were surveyed. On August 23 Culver Pond was surveyed, and the Upper Lake survey was conducted on August 24th. Culver Pond was first surveyed by the present random sampling methods in 1966. That survey revealed an estimated

COMPARISON TOTALS 1966-1967-1968

	<u>Adult-Cygnets</u>			<u>Totals</u>		
	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>
<u>MONTANA</u>						
Red Rock Lakes Refuge	240-54	184-20	155-90	294	204	245
Centennial Valley other than refuge	104-11	113-5	79-24	115	118	103
Beaverhead Nat'l. Forest and other areas	7-1	7-0	8-9	8	7	17
MONTANA TOTALS	351-66	304-25	242-123	417	329	365
<u>IDAHO</u>						
Targhee Nat'l. Forest	21-8	26-3	26-2	29	29	28
Island Park Area	39-13	59-5	62-4	52	64	66
Other Areas	2-0			2		
IDAHO TOTALS	62-21	85-8	88-6	83	95	94
<u>WYOMING</u>						
Yellowstone Nat'l. Park	57-12	55-2	57-4	69	57	61
Nat'l. Elk Refuge	7-4	6-3	3-2	11	9	5
Grand Teton Nat'l. Park	26-4	24-5	29-14	30	29	43
Targhee Nat'l. Forest	9-6	12-2	10-3	15	14	13
Teton Nat'l. Forest	2-2	2-0	2-2	4	2	4
WYOMING TOTALS	101-28	99-12	101-25	129	111	126
NEVADA TOTALS	20-9	26-1	24-10	29	27	34
OREGON TOTALS	32-13	33-12	40-11	45	45	51
SOUTH DAKOTA TOTALS	34-21	34-21	55-21	55	55	76
WASHINGTON TOTALS	36-0*	35-4	36-1	36*	39	37
MINNESOTA TOTALS	2-0	2-0	18-0	2	2	18
CAPTIVE SWANS **	77-7	85-10	97-9	84	95	106
GRAND TOTAL OF ALL AREAS CENSUSED	713-165	701-93	701-206	878	796	907

* Includes 11 cygnets transferred in 1965, and 20 (1 of which died) in 1966.

** Includes 10 Trumpeter Swans outside Continental United States.

Red Rock Lakes NW RefugeTotal - All areas

<u>Year</u>	<u>Adult</u>	<u>Cygnets</u>	<u>Total</u>	<u>Adult</u>	<u>Cygnets</u>	<u>Total</u>
1932	19	7	26	57	12	69
1933	15	9	24	49	17	66
1934	16	26	42	48	49	97
1935	30	16	46	46	27	73 *
1936	31	26	57	76	41	117
1937	34	51	85	81	77	158
1938	28	42	70	93	55	148
1939	50	59	109	123	76	199
1940	58	48	106	123	68	191
1941	52	44	96	143	69	212
1942	45	43	88	98	53	151 *
1943	88	25	113	137	34	171 *
1944	106	58	164	207	72	279
1945	113	50	163	180	55	235 *
1946	124	46	170	289	72	361
1947	131	49	180	292	60	352
1948	121	73	194	312	106	418
1949	132	61	193	348	103	451
1950	106	40	146	303	73	376
1951	170	76	246	417	118	535
1952	184	55	239	478	93	571
1953	211	38	249	478	99	577
1954	352	28	380	560	82	642
1955	242	41	283	495	95	590
1956	293	39	332	507	81	588
1957	159	45	204	399	89	488
1958	270	40	310	565	138	703
1959	271	40	311	582	99	681
1960	163	34	197	574	92	667
1961	155	14	169	536	83	619
1962	179	53	232	519	116	635
1963	145	122	267	488	227	715
1964	180	22	302	699	65	764
1965	190	16	206	683	99	782
1966	240	54 **	294	713	165	878
1967	184	20	204	701	93	794
1968	155	90	245	701	206	907

* Marginal areas not censused completely.

** Total does not include 11 cygnets captured from the refuge for transfer to Turnbull National Wildlife Refuge.

1668.9 tons of vegetation in the pond, and production of 62.3 tons per acre. The results of the 1968 survey differed markedly from those of 1966; 919.7 tons of vegetation were produced in the pond, at the rate of 34.3 tons per acre. This represents a drop of approximately 55%. Probably the major reason the 1966 survey showed such a higher projected tonnage is the fact that the vegetation in the pond seems to become increasingly rank as one travels from south to north. Only six sample stations were located in the central area (moderately dense vegetation) of the pond in 1966, but ten were located in the same area in 1968. Ten sample stations were located in the northern portion (extremely rank vegetation) in 1966, while only three were found there in 1968.

The survey of the Upper Lake revealed a tonnage per acre of 7.5; quite similar to the 7.9 found in 1966. Projected tonnage of vegetation in the lake was found to be 22,014 as compared to 22,840 in 1966.

H. Moose Management Study

The refuge is cooperating with the Montana Fish and Game Department on a study project involving the moose of the Centennial Valley. The vast majority of moose-use in the valley takes place on the refuge; and, in addition, the State Game Department issues five hunting permits on the refuge and ten in the area surrounding the refuge. Because of these circumstances we are concerned about proper management of the habitat and the moose population.

Mr. Robert Dorn, Wildlife Management student from Montana State University, was in residence on the refuge during the summer months and for a three-month period this winter conducting field studies. The major objectives of this study project include the determination of: seasonal habitat-type use, sex and age ratios, the extent of cattle-moose competition, and seasonal food habits.

The following are some of the relevant findings taken from a progress report of Mr. Dorn's summer activities:

"Eight habitat types were differentiated. The willow type was most used for feeding and bedding. Browse made up 98.2% of all moose food...with one species accounting for 58.1% of the total. Another species of willow accounted for 50.2% of all cattle browse use. Cattle-moose competition is probably insignificant, although a definite conclusion must await winter data."

Other interesting notes not included in Mr. Dorn's report indicate that in the course of his field studies, he has gathered over 490 species of plants from the refuge. Among these are 14 different species of willow, which might account for some of the lack of competition for browse between moose and cattle. He was kind enough to present a duplicate set of all plants collected to our refuge herbarium. Now that winter data is being gathered it appears that moose are changing their food preferences and are beginning to feed on the particular species

of willow which was so heavily used by cattle during the summer. Insufficient evidence has been collected to determine whether or not this turn of events will be detrimental.

Some discussion has been given to extending this study project to include placing either coloured neck collars or some type of biotelemetry devices on a sample of the moose population as a second phase of the study. The only factual data we now have pertaining to movements of the moose utilizing the refuge are periodic sightings of two neck-banded moose which were captured and banded near St. Anthony, Idaho, thirty-five miles south of the refuge. At the present time plans for this second phase of the study are in a rather vague form and nothing definite has actually been decided, but it is hoped that it will soon come to fruition.

VI PUBLIC RELATIONS

A. Recreation

Public use of Red Rock Lakes Refuge was reduced from that made in 1967. Poor weather and road conditions were limiting factors. Then too, fishing was poor. The expert anglers limited out - the novice went away empty handed. We are attempting to obtain traffic counters to give a more accurate visitor count.

The refuge had little nation-wide publicity last winter and this too helped reduce our visitor load. A trumpeter swan documentary film (30 minutes long) is being released on National TV this winter and should increase our visitor load in 1969.

The following table is a comparison of visitor days use recorded. As the public has almost unlimited access to the refuge during the summer months, we can but estimate the amount of public use through spot checks.

	<u>Visits</u> <u>1964</u>	<u>Visits</u> <u>1965</u>	<u>Visits</u> <u>1966(8 hr)</u>	<u>Visits</u> <u>1967(12 hr)</u>	<u>Visits</u> <u>1968(12 hr)</u>
Fishing	950	930	1,290	1,370	966
Hunting	1,310	1,085	740	700	230
Other	3,100	3,200	2,172	4,625	1,234

A new form of recreation to Red Rock Lakes Refuge is developing. Winter oversnow travel from West Yellowstone, Idaho Falls, and Bozeman is increasing rapidly. These small snow-mobiles are reaching the refuge area bringing with them the problems they have caused in other areas. Breaking into buildings, stealing emergency supplies, etc. The refuges main concern is for the trumpeter swan feeding area and the moose herd.

So far - the refuge has had no real problems with this form of winter sport (?). We are contacting the various snowmobile clubs asking them not to enter the swan feeding areas or the moose habitat. Unofficial snowmobile use should be prohibited on the entire refuge. The Targhee and Beaverhead National Forests and Yellowstone National Park have had to severely limit oversnow travel for protection of facilities and in an attempt to avoid Tort Claims.

B. Refuge Visitors

<u>Date</u>	<u>Name</u>	<u>Organization</u>	<u>Purpose</u>
3/12	Howard Gray	Pacific Outdoors Films	Photography
4/29	Orville W. McCarver	Ext. Horticulturist	Landscaping
4/29	John Maki	Ext. Agent	"

<u>Date</u>	<u>Name</u>	<u>Occupation</u>	<u>Purpose</u>
5/7	Joe Mack	Weather Bureau	New weather guage
5/7	Bill Downs	" "	" " "
5/17	Mr & Mrs L.S. Lewis	Bird watcher	Birding
6/3	Charles Draper	Photographer	Wildlife
6/6	Jim Ford	Mont. Fish & Game	Offical
6/6	John J. Gaffney	" " "	"
6/6	Joe Egan	" " "	"
6/11	James M. Micieds	Wildlife Biologist	Swan Study
6/11	Bill Maquire	J.R.Simplot Co.	Mining
6/14	Roger P. King	FHA	Courtesy
6/18	Jack E. Truitt	Bureau of Mines	Surplus truck
6/18	Walt Collins	" " "	" "
6/18	Andrew M. Ekmen	Soil Conservation	Offical
6/30	Clark Seay	Lab tech. New Mexico	Visiting
6/30	James S. Ireland	" " " "	"
6/30	David Sean	New Mexico	Fishing
7/2	Russ Hoffman	Grays Lake Refuge	Courtesy call
7/6	Ted Levitt	Park Ranger, YNP	" "
7/6	Stan Carter	Naturalist, YNP	" "
7/6	Rick Anderson	Park Ranger, YNP	" "
7/6	Rock Wolf	Teton National Park	Bird watching
7/9	Robin Doughly	England, U. of Calif.	Thesis material
7/9	H. Wolfe	Zoologist, Germany	Conservation
7/10	Dr & Mrs J.E. Brisbin	Chiropractor	Photography
7/12	Gene Bennett	BLM	Fire cache check
7/12	Al Dult	"	" " "
7/20	Jon Severson	Student	Bird watching
7/20	Tom Cook	"	Wildlife
7/22	Dr. & Mrs. W.F.Stanly	Prof.Biology, N. Y.	Wildlife
7/25	Kerry Constan	Mont. Fish & Game	Offical
7/25	Howard Chrest	" " "	"
7/26	Henry Baetkey	Regional Office	"
7/26	John Jones	Washington D.C.	"
7/26	Joseph P. Linduska	" "	"
7/26	Bill Downs	Weather Bureau	"
7/26	Glenn Buegher	" "	"
8/12	Richard Robinson	Electrical Engineer	Birding
8/13	Faye C. Jones	U. of Arizonia	"
8/21	Vernon Ekedahl	Regional Office	Inspection
8/26	Madu Maurice Ukadike	Student, Biofra	Wildlife
8/26	Habib, Jeilan	" Kenya	"
8/26	Sylvester Kwankam	" Cameroun	"
8/26	Jim Francoise	" Seychelles	"
8/26	Jean Mautamba	" Congo	Wildlife
9/9	David Hatch	" Canada	Visit
9/9	David Thomse	Naturalist, Canada	"
9/10	R.W. Hunt	Forrester, Hermipen Pk.	Swan transfers
9/10	Don Olstad	Maintenance Super "	" "
9/10	John Seedenhider	Research, U. of Mont.	Visit

<u>Date</u>	<u>Name</u>	<u>Occupation</u>	<u>Purpose</u>
9/15	Ed & Olive Bushby	Portland, Oregon	Photography
9/18	Bruce Stollberg	Fairfax, Va., Mang.	Visit
9/20	Jim Lankford	Regional Office	Offical
9/27	Dr. & Mrs. H. Rieget	Dentist, Illinois	Birding
9/28	Mr. & Mrs. R. Winch	Photographer, Minn.	"
9/28	John Findley	Regional Office	Courtesy
9/28	Clay Crawford	" "	"
10/1	Bill Garner	" "	Inspection
10/3	Kojo Tanaka	Photographer, Japan	Photography
10/17	C.R. "Dutch" Estermier	Regional Office	Quarters survey
10/17	Robert Twist	Camas NW Refuge	Courtesy
10/17	Edward Smith	Regional Office	"
10/29	Robert M. Ferguson	Forrester, Dillon	Offical

C. Refuge Participation

January 1 -

February 23 Biologist Annear on temporary assignment at Kern-Pixley National Wildlife Refuge for the purpose of Botulism Control.

January 19 Manager Vivion attended the Montana Wilderness Association State Conference in Kalispell, Montana.

February 2 Manager Vivion participated in annual interagency meeting on Soil and Moisture practices. Meeting held in Dillon, Montana.

February 29 Manager Vivion and Biologist Annear met with US Forest Service and Bureau of Land Management supervisory personnel in Dillon, Montana to review interagency agreements.

March 8-11 Biologist Annear accompanied Howard Gray, Pacific Outdoorsman Films, for two days of swan photography at MacDonald Pond; and for a third day devoted to aerial photography of the refuge and Island Park trumpeter swan populations. Manager Vivion assisted Mr. Gray in obtaining film sequences of moose and winter scenery on the refuge.

March 15 Manager Vivion met with Montana and Idaho State Fish and Game personnel in Dubois, Idaho setting up a moose study on the refuge.

May 15-16 Manager Vivion and Biologist Annear in Dillon, Montana attending US Forest Service Grazing Workshop.

- May 23 Manager Vivion and Biologist Annear met with Montana State Fish and Game supervisory personnel at the refuge concerning moose study.
- May 31 -
June 2 Manager Vivion attended Montana Wildlife Society State Conference in Hamilton, Montana. Gave 30 minutes slide talk on refuge and swan. Presented display of conservation photographs and material.
- June 6 Manager Vivion and Biologist Annear met with Montana State Fish and Game personnel on refuge hunting and fishing proposals.
- June 10 Manager Vivion and Biologist Annear met with Red Rock Cattlemens Association in Monida, Montana discussing refuge grazing and objectives.
- July 25 Manager Vivion and Biologist Annear accompanied Montana Fish and Game personnel Kerry Constan and Howard Crest on a tour of range units 14G and 15G pertaining to improved management of sage grouse habitat.
- July 25 Biologist Annear gave a talk to a group of 25 young people from Forest Knolls, California who were touring the north-central Rockies.
- August 6 Manager Vivion gave a 45 minute slide talk to 30 grade and high school teachers attending summer school at Western Montana College, Dillon, Montana.
- August 26 Five African exchange students visited the refuge with Dr. George Rhule, National Park Service, Washington, D.C. Biologist Annear toured the refuge with the group discussing refuge objectives and conservation in general.
- August 24 Biologist Annear gave a one hour slide talk to a group of 35 Boy Scouts from Dillon, Montana at the Montgomery Ski Chalet.
- Sept. 9-11 Manager Vivion and Biologist Annear with Hennepin Park Reserve personnel at refuge to pick up swan and study habitat.
- September 12 Biologist Annear assisting Howard Gray photographer in obtaining film sequences of trumpeter swan family groups and cygnet flight instruction.
- Sept. 15-16 Biologist Annear in Helena to attend GSA Defensive Driving School.

- October 7 Manager Vivion and Biologist Annear met with Audubon Society and Wilderness Association in Bozeman. Annear gave a one hour slide show on refuge, and wilderness possibilities were discussed.
- November 2 Manager Vivion attended retirement party for Clerk Gladys Young, National Bison Range, in Polson, Montana.

D. Hunting

Waterfowl - Lower Red Rock Lake was open to waterfowl hunting. During the hunting season duck populations on the lake were about 75% of normal but most hunters had limited out by 2:00 PM opening day. Peak hunting pressure occurred on opening day with 60 hunters on the refuge. As usual, hunting was fair to good for the first two weekends and then rapidly deteriorated. After the second weekend, big game seasons began opening and drew hunters off to other game.

Antelope - Antelope hunting was permitted in grazing units 14, 16 and 17 on the north side of the refuge. Hunting pressure was light and virtually all encountered on the opening day. Success was fair. The antelope were widely scattered, in open areas and quite nervous. We know of 17 pronghorns taken on refuge lands.

Deer and Elk - All refuge lands south of Red Rock Pass Road were open to deer and elk hunting. Hunting pressure was light as these areas are difficult to hunt and get animals out of. We know of two elk and five deer taken on refuge. Four additional elk were taken immediately east of refuge lands in the Tom Creek drainage and a few deer were taken west of the refuge.

Moose - Five permits were issued for moose hunting on the refuge. Three animals had been taken by 10:30 opening morning, the fourth was taken late in the afternoon of that day. The fifth permit holder hunted part of one day without success and never returned.

Big game hunting opportunities in the refuge area are unlimited but lightly used. We still feel that refuge hunting should be adjusted to benefit other wildlife oriented recreation.

E. Violations

Refuge personnel observed no law violations that could be prosecuted in either Federal or State courts. Frequent, unexpected visits to public use areas by refuge personnel on patrol helps keep hunters and fishermen honest.

F. SAFETY

SAFETY meetings are held monthly with regular staff personnel rotating responsibility. SAFETY material, literature, and movies

are shown. SAFETY is stressed with crew members before starting each job and "tailgate" discussions on SAFETY are held whenever potential problems arise.

There were no lost time accidents this year. The station now has 914 lost time accident free work days. The previous record was 25 years.

Guard rails were installed around all water control structures. Barriers were placed across all roads that were unsafe for visitor travel.

Other items of SAFETY reported elsewhere in this report are summarized below:

1. General cleanup of refuge.
2. Rebuild spring facility at Upper Lake Campground.
3. Well water into office-service building to replace creek water system.
4. Rewiring of electrical system in office-service building and Quarters 90, 94, and 110.
5. Installation of adequate radio communication system.
6. Observation platform built on biologist vehicle.
7. Completed public use road in fishing area removing vehicular travel from wet areas and narrow roadways on top of dikes.

VII OTHER ITEMS

On October 13, 1968 four young men Harry Mainard, Dale Garrison, Jim Petritz, and Dave Worley all from Butte, Montana were fished out of Lower Red Rock Lake by refuge personnel. These four had borrowed two tin duck boats and gone out on the lake to hunt ducks. Wind driven waves swamped both boats, one of which was never salvaged. The boys, wet, cold and frightened made it to one of the vegetated islands to wait for help. Other passing hunters thought the boys were being friendly not realizing the frantic waving was not a show of comradeship. Refuge personnel spotted the difference and came to the rescue. Oh yes, the boys salvaged one widgeon but lost one shotgun, a boat, and a dozen decoys.

On February 1, 1968 Mr. "Tobe" Morton, a refuge neighbor living year-round in Alaska Basin, was taken out to Monida by refuge personnel. Mr. Morton had developed a severe kidney infection and was too sick to get "out" by himself.

Phosphate mining in the Centennial Mountains, refuge watershed, has not been abandoned. The prospecting permit requested for Sun Oil Co. in 1967 is still being appealed by USDA and AES. It appears the refuge may never be free of this threat.

Rulemaking concerning private rental of the refuges' three hunt club facilities is now final. The Director ruled that rental of these facilities would be terminated December 31, 1969. The Idlewild Club members appealed this decision to the Secretary of the Interior and their appeal was turned down. A few more grey hairs but one more battle for the refuge won.

Mr. Montgomery still operates his ski run at Lakeview and still isn't drawing a paying crowd. He converted one of his large equipment buildings into a Recreation House this year. It has a large indoor, heated swimming pool and a game room.

Several refuge grazing permittees have attempted to sell their Centennial Valley holdings recently. The refuge manager steadfastly refuses to allow them to sell or transfer their full refuge grazing privileges in these deals and the deals fall through. Transfers of grazing privileges to new landowners in the past has caused hard feelings on the part of our old time permittees against the refuge. Such transfers of refuge grazing privileges in the past involved rather large sums of money - to the seller.

B. Photographs

Photographs appear at the end of the report. Our black and white photographs turned out duds because of a faulty camera - so about all we had was color. Photographs by Vivion unless otherwise noted.

C. Acknowledgements

Manager Vivion

I General
III Development
IV Resource Management
VI Public Relations
VII Other Items

Biologist Annear

II Wildlife
V Applied Research
N. R. Forms
Some typing

Katie Lee Hotchkiss

Some N. R. Forms, Typing - Deciphering notes, calming tempers, and coffee-brewing

Our summer crew of Temporaries is to be complimented again on their work accomplishments, SAFETY, courtesy to the public, and esprit de corps. Dedication to "their" refuge was obvious.

Heavy Duty Mechanic Hotchkiss is extremely valuable to this refuge and its operation. He keeps our old equipment going in spite of the handicap of a poor shop to work in. Ray is always ready with a grin to put in "extra time" to keep things going and carries more than his fair share of the problem load.

Katie Lee Hotchkiss fills our clerk-typist position admirably well on a half-time basis. She remains enthusiastic over wildlife and the refuge program. Katie and Ray have been at Red Rock Lakes for nine years now, well on the way to setting a record for longevity. This in itself is a remarkable feat and a credit to the Hotchkiss family.

SIGNATURE PAGE

Submitted by:

Owen H. Vivion
(Signature)

Owen H. Vivion

Refuge Manager
(Title)

Date: _____

Approved, Regional Office:

Date: 2/18/69

Crawford Lamborn
(Signature)

Asst. Dir. Insp.
(Title)

WATERFOWL

MONTHS OF January TO April , 1968

[illegible]

3 -1750a

Cont. 1
(Rev. March 1953)WATERFOWL
(Continuation Sheet)REFUGE Red Rock LakesMONTHS OF January TO April, 1968

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total	
	3/10-16 11	3/17-23 12	3/24-30 13	3/31-4/6 14	4/7-13 15	4/14-20 16	4/21-27 17	4/28-4/29 18		: seen :	: total
Swans:											
Whistling											
Trumpeter	228	240	220	233	220	225	203		25,592		
Geese: Total Swan	228	240	220	233	220	225	203		25,592		
Canada	20	50	85	60	120	200	150		3,829		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other Total Geese	20	50	85	60	120	200	150		3,829		
Ducks:											
Mallard	1,300	1,200	1,300	1,100	1,100	2,280	2,580		161,070		
Black											
Gadwall	40	40	50	50	100	280	100		9,590		
Baldpate	150	200	200	280	550	900	1,200		32,410		
Pintail	50	50	80	100	190	480	960		15,170		
Green-winged teal				40	100	400	600		8,890		
Blue-winged teal							30		210		
Cinnamon teal					20	80	100		1,400		
Shoveler					20	60	100		1,260		
Wood											
Redhead				40	320	500	750		11,270		
Ring-necked		5	10	20	100	120	150		2,835		
Canvasback				30	80	220	300		4,410		
Scaup	30	30	50	60	100	400	780		11,200		
Goldeneye	900	1,000	1,000	800	510	250	250		83,580		
Bufflehead	20	20	40	40	80	100	100		3,990		
Ruddy							20		140		
Other W. Grebe					5	5	10		110		
Total Ducks	2,490	2,515	2,730	2,860	3,605	6,075	8,330		347,865		
Coot:			10	100	200	1,100	4,000		37,870		

(over)

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans	25,592	250		Principal feeding areas <u>MacDonald Pond and Culver Pond</u>
Geese	3,829	200		
Ducks	347,865	8,330		Principal nesting areas _____
Coots	37,870	4,000		
				Reported by <u>John T. Annear, Biologist</u>

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1751

Form NR-1A
(Nov. 1945)MIGRATORY BIRDS
(other than waterfowl)Refuge Red Rock LakesMonths of January to April 1960

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production		(6) Total
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young Estimated Number
I. Water and Marsh Birds:									
Hared Grebe	2	4/8	25	4/30	Still present				50
Great Blue Heron	1	3/29	40	4/30	"	"			80
Sandhill Crane	10	4/10	150	4/30	"	"			150
II. Shorebirds, Gulls and Terns:									
Common Snipe	2	4/19	50	4/30	"	"			50
Killdeer	2	3/29	200	4/30	"	"			200
California Gull	2	4/6	120	4/30	"	"			150
Ring bill Gull	3	3/29	40	4/30	"	"			50
Long billed Curlew	3	4/25	25	4/30	"	"			25

(over)

(1)	(2)	(3)	(4)	(5)	(6)		
III. <u>Doves and Pigeons:</u>							
Mourning dove	1	4/16	10	4/30	still present	20	
White-winged dove							
IV. <u>Predaceous Birds:</u>							
Golden eagle	Present all Period	4	1/12	"	"	10	
Duck hawk	1	3/24	4	4/30	"	"	6
Horned owl	Resident			"	"	15	
Magpie	Present all Period			"	"	200	
Raven	Since last period - Occasional observations during period					15	
Crow	4	3/14	300	4/11	still present	300	
Bald eagle	Observed throughout period			"	"	6	
Red tail hawk	2	4/11	5	4/30	"	"	8
Rough leg hawk	3	4/11	4	4/30	"	"	6
Marsh hawk	1	3/28	4	4/30	"	"	10
Sparrow hawk	2	4/5	20	4/30	"	"	20
Reported by John T. Annear, Biologist							

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

* Only columns applicable to the period covered should be used

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- | (1) SPECIES: | Use correct common name. | (2) DENSITY: | (3) YOUNG PRODUCED: | (4) SEX RATIO: | (5) REMOVALS: | (6) TOTAL: | (7) REMARKS: |
|--------------|--|---------------------|---|----------------|---|---------------|--|
| (2) DENSITY: | Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks. | (3) YOUNG PRODUCED: | Estimated number of young produced, based upon observations and actual counts in representative breeding habitat. | (4) SEX RATIO: | This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available. | (5) REMOVALS: | Indicate total number in each category removed during the report period. |
| (6) TOTAL: | Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons. | (7) REMARKS: | Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested. | | | | |

* Only columns applicable to the period covered should be used.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Red Rock Lakes Refuge

Year ending April 30, 1968

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5) Total Popula- tion
	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator * Control	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
Common Name								Permit Number	Trappers Share	Refuge share				
Beaver	Willow, aspen, streams 2,400 acres	120		7				I-6710	100%					15
Muskrat	Marsh-water 10,000 acres	3		46										1,700
Porcupine	Upland, forest 5,000 acres	66												75
Coyote	Marsh, meadow, upland 26,000 acres	5,200												5
Red Fox	Marsh, meadow, upland 26,000 acres	650		11										40
Longtail weasel	Meadow, uplands, forest 19,000 acres	95		6										150
Mink	Lakes, streams, marsh 15,000 acres	37		37										350
Badger	Meadow, upland, forest 19,000 acres	380		3										40
Striped Skunk	Marsh, meadow, upland 26,000 acres	260		9										100
Bobcat	Upland, forest 25,000 acres	2,500		13										10

* List removals by Predator Animal Hunter

REMARKS:

Reported by John T. Annear, Biologist

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

- (1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)
 - (2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
 - (3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headings listed.
 - (4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.
 - (5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.
- REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

3-1750
Form N1
(Rev. March 1953)

WATERFOWL

REFUGE Red Rock Lakes

MONTHS OF May ^{thru} August, 19 68

(1) Species	(2) Weeks of reporting period									
	4/28-5/4	5/5-11	5/12-18	5/19-25	5/26-6/1	6/2-8	6/9-15	6/16-22	6/23-29	6/30-7/6
	1	2	3	4	5	6	7	8	9	10
Swans:					Aerial		Aerial		Aerial	
Whistling										
Trumpeter	210	220	220	215	210	215	200	285	340	348
Geese: Total swan	210	220	220	215	210	215	200	285	340	348
Canada	150	140	180	180	200	200	200	225	225	210
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other Total Geese	150	140	180	180	200	200	200	225	225	210
Ducks:										
Mallard	3,000	3,300	3,300	3,500	3,500	4,500	5,300	5,750	6,000	7,850
Black										
Gadwall	400	400	350	350	400	600	700	800	800	700
Baldpate	1,200	1,000	1,000	1,100	1,200	1,900	2,100	2,500	2,200	1,800
Pintail	1,100	1,000	900	800	800	900	1,000	2,000	2,500	3,700
Green-winged teal	650	500	300	200	200	300	350	350	400	400
Blue-winged teal	50	100	100	100	50	100	200	200	250	340
Cinnamon teal	100									
Shoveler	100	100	120	140	180	180	200	200	200	200
Wood										
Redhead	800	700	800	900	1,000	2,000	2,000	2,500	2,500	2,000
Ring-necked	350	400	550	700	700	700	700	600	500	400
Canvasback	380	450	450	400	380	400	400	400	400	400
Scaup	800	900	1,150	1,300	1,400	1,800	1,800	2,500	2,500	2,000
Goldeneye	250	300	250	200	150	120	180	120	150	150
Bufflehead	100	100	140	120	140	150	180	180	200	200
Ruddy	200	300	400	600	800	900	900	900	800	900
Other Mergansers	20	20	20	20	20	40	40	40	50	50
Total Ducks	9,400	9,570	9,830	10,430	10,920	11,590	15,990	19,040	19,450	21,090
Coot:	4,200	4,800	5,000	4,500	4,400	5,100	5,500	5,500	6,000	6,000

3-1750a

Cont. -1

(Rev. March 1953)

WATERFOWL (Continuation Sheet)

REFUGE Red Rock Lakes NW RefugeMONTHS OF May thru August, 1968

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total	
	7/7-13 11	7/14-20 12	7/21-27 13	7/28-8/3 14	8/4-10 15	8/11-17 16	8/18-24 17	8/25-31 18			
Swans:	Aerial		Aerial		Aerial			Aerial			
Whistling											
Trumpeter	340	335	330	325	325	305	295	290	35,056	50	90
Geese: Total Swans	340	335	330	325	325	305	295	290	35,056	50	90
Canada	210	200	180	180	170	210	250	150	24,220	12	87
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other Total Geese	210	200	180	180	170	210	250	150	24,220	12	87
Ducks:											
Mallard	9,000	8,800	8,100	8,100	15,400	21,500	23,600	16,800	1,101,100	55	1,296
Black											
Gadwall	800	1,600	2,800	4,200	7,900	10,400	11,700	8,200	371,700	12	150
Baldpate	1,900	1,800	7,800	13,000	18,200	23,800	27,900	20,300	935,900	15	318
Pintail	5,000	4,950	7,300	7,700	10,100	13,200	16,000	9,500	633,150	30	714
Green-winged teal	350	300	250	250	200	300	300	300	11,300	7	156
Blue-winged teal	400	500	650	750	800	1,700	2,550	2,100	76,580	9	210
Cinnamon teal											
Shoveler	300	300	300	400	500	600	650	600	36,890	19	444
Wood											
Redhead	2,500	3,500	5,500	7,500	8,200	9,200	9,500	8,600	487,900	48	1,140
Ring-necked	250	250	200	100	80	100	100	80	46,620	36	846
Canvasback	300	200	100	100	90	100	100	90	35,980	10	306
Scaup	2,000	2,000	2,500	2,800	2,380	2,500	2,700	2,500	248,710	70	1,644
Goldeneye	100	80	90	100	90	100	100	90	17,920	2	12
Bufflehead	200	200	200	300	300	600	600	1,200	35,770	5	120
Ruddy	1,000	900	800	800	700	900	900	800	94,500	17	414
Other Mergansers	50	50	50	60	70	100	100	100	6,300	5	
Total Ducks	24,150	30,430	36,640	46,160	65,010	85,100	96,800	71,260	4,170,320	358	7,770
Coot:	6,000	6,400	6,800	6,800	9,700	13,100	11,000	16,800	914,200	456	4,295

(over)

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans	35,056	348	90	Principal feeding areas <u>MISSISSIPPI RIVER</u>
Geese	24,220	225	87	<u>Upper and Lower Lake</u>
Ducks	4,170,320	96,800	7,770	Principal nesting areas <u>Lakes, River Marsh and Impoundments</u>
Coots	914,200	16,800	3,960	
				Reported by <u>John T. Annear, Biologist</u>

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1751

Form NR-1A

(Nov. 1945)

MIGRATOR. BIRDS

(other than waterfowl)

thru

Refuge Red Rock LakesMonths of May~~xx~~August 1968

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Horned grebe	12	5/10	200	8/23	Still Present					300
Hared grebe	Previous period		500	8/23	"	"			80	550
Western grebe	5	5/19	175	8/9	"	"			35	250
Pied-billed grebe	2	5/19	50	8/9	"	"			20	100
White pelican	50	5/6	400	6/28	"	"	Non-breeders			400
Great blue heron	Previous period		200	8/9	"	"	1	20	62	225
Black crowned night heron	4	5/24	20	8/9	"	"			15	35
American bittern	2	5/10	50	Aug.	"	"				50
Sandhill Crane	Previous period		250	8/9	"	"				250
Virginia rail	5	7/5	400	Aug.	"	"				400
Sora rail	2	6/14	1,800	Aug.	"	"				1,800
II. Shorebirds, Gulls and Terns:										
Killdeer	Previous period		700	Aug.	"	"				700
Common snipe	"	"	325	"	"	"				325
Long-billed curlew	"	"	180	July	40	8/30				225
Spotted sandpiper	15	5/6	250	Aug.	Still present					250
Willet	3	5/6	275	"	"	"				275
Greater yellowlegs	3	6/21	50	"	"	"				50
Lesser yellowlegs	3	6/21	40	"	"	"				40
Long-billed dowitcher	5	5/21	75	"	"	"				75
Western sandpiper	10	6/6	100	"	"	"				100
Avocet	6	5/7	200	"	"	"				225
Wilson's phalarope	8	5/7	3,500	July	"	"				3,500
Northern phalarope	5	5/14	350	"	"	"				350
California gull	Previous period		325	Aug.	"	"				325
Ring-billed gull	"	"	175	"	"	"				175
Frankline gull	20	6/7	50	"	"	"				50
Forsters tern	10	5/24	100	"	"	"				125
Common tern	6	5/24	300	"	"	"				325
Black tern	30	5/17	180	"	"	"				200

(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. <u>Doves and Pigeons:</u>	Previous period		45	8/9	still present				45
Mourning dove									
White-winged dove									
IV. <u>Predaceous Birds:</u>	Observed occasionally thru period								2
Golden eagle									
Duck hawk									20
Horned owl	Resident								325
Magpie	"								6
Raven			4	8/9	still present				200
Crow			175	8/20	"				15
Red-tailed hawk	Previous period		10	8/20	"				15
Swainsons hawk	2	5/3	10	8/13	"				5
Rough-legged hawk	Previous period		2	Aug.	"				5
Ferruginous hawk	1	5/3	2	"	"				40
Marsh hawk	Previous period		30	"	"				8
Prairie falcon	1	6/3	Observed all period		"				6
Peregrine falcon	Previous period		"	"	"				150
Sparrow hawk	"		110	Aug.	Still present				

Reported by John T. Annear
Biologist

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Red Rock Lake For 12-month period ending August 31, 1968

Reported by John T. Appear Title Biologist

(1) Area or Unit Designation	(2) Habitat Type Acreage	(3) Use-days	(4) Breeding Population	(5) Production
Unit I Impoundments	Crops	Ducks	1,296	1,207
	Upland	Geese	18	20
	Marsh	Swans	8	7
	Water	Coots	268	500
	Total	Total	1,580	1,734

Unit II Upper Lake	Crops	Ducks	1,204	2,661
	Upland	Geese	10	4
	Marsh	Swans	16	6
	Water	Coots	96	720
	Total	Total	1,326	3,391

Unit III Swan Lake	Crops	Ducks	1,308	897
	Upland	Geese	12	10
	Marsh	Swans	22	17
	Water	Coots	552	1,005
	Total	Total	1,894	1,929

Unit IV River-Marsh	Crops	Ducks	2,412	1,797
	Upland	Geese	38	20
	Marsh	Swans	48	39
	Water	Coots	756	1,425
	Total	Total	3,254	3,281

Unit V Lower Lake	Crops	Ducks	280	1,011
	Upland	Geese	60	25
	Marsh	Swans	22	21
	Water	Coots	516	645
	Total	Total	878	1,702

Unit VI Upland	Crops	Ducks	64	195
	Upland	Geese	4	8
	Marsh	Swans		
	Water	Coots		
	Total	Total	68	203

REFUGE TOTALS	Crops	Ducks	6,564	7,770
	Upland	Geese	142	87
	Marsh	Swans	116	90
	Water	Coots	2,188	4,295
	Total	Total	9,010	12,242

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

- (1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.
- (2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.
- (5) **Production:** Estimated total number of young raised to flight age.

3-1752

Form No. 1
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Red Rock Lakes

Months of

May

thru

toAugust, 1948

(1) Species	(2) Density	(3) Young Produced	(4) Sex Ratio	(5) Removals	(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'd. Estimated Total	Percentage	Hunting For Re- stocking For Research	Estimated number using Refuge Pertinent information not specifically requested. List introductions here.
Blue Grouse	Conifers, 3000 acres				20	Usually seen only along south boundary of refuge.
Ruffed Grouse	Aspen-Fir-Willow 3,000 acres				75	Based on drumming counts.
Sage Grouse	Sagebrush-Grass 3,000 acres				60	Few birds were sighted this summer in contrast to last year when sightings occurred on all but the south part of the refuge.
(Hungarian) Gray Partridge	Sagebrush-Meadow 24,000 acres		None observed this period		20	

* Only columns applicable to the period covered should be used.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- | | |
|---------------------|--|
| (1) SPECIES: | Use correct common name. |
| (2) DENSITY: | Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks. |
| (3) YOUNG PRODUCED: | Estimated number of young produced, based upon observations and actual counts in representative breeding habitat. |
| (4) SEX RATIO: | This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available. |
| (5) REMOVALS: | Indicate total number in each category removed during the report period. |
| (6) TOTAL: | Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons. |
| (7) REMARKS: | Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested. |

* Only columns applicable to the period covered should be used.

3-1750
Form N 1
(Rev. March 1953)

WATERFOWL

REFUGE Red Rock Lakes

MONTHS OF September TO December, 1968

(1) Species	(2) Weeks of reporting period									
	: 9/1-7	: 8-14	: 15-21	: 22-28	: 9/29-10/5	: 6-12	: 13-19	: 20-26	: 10/27-11/2	: 3-9
	: 1	: 2	: 3	: 4	: 5	: 6	: 7	: 8	: 9	: 10
Swans:		Aerial			Aerial			Aerial		
Whistling							850	1,525	1,300	325
Trumpeter	240	198	200	210	210	210	220	220	260	260
Geese: Total Swans	240	198	200	210	210	210	1,070	1,745	1,560	585
Canada	150	175	200	225	250	340	400	450	200	100
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other Total Geese	150	175	200	225	250	340	400	450	200	100
Ducks:										
Mallard	19,750	20,600	22,100	20,200	17,200	13,900	10,050	6,400	4,500	3,000
Black										
Gadwall	10,050	11,000	10,700	10,100	8,900	6,900	4,500	2,510	700	460
Baldpate	23,400	26,950	31,100	30,900	29,600	23,200	21,100	19,900	18,700	10,300
Pintail	10,500	9,700	8,100	6,350	2,100	1,900	1,500	1,250	1,000	700
Green-winged teal	400	700	700	600	600	350	150	70	50	10
Blue-winged teal	2,300	2,300	2,000	1,450	400	300	50	20		
Cinnamon teal										
Shoveler	800	1,350	1,500	1,400	1,000	1,700	2,000	1,500	200	80
Wood										
Redhead	8,900	11,600	12,400	8,700	5,100	3,200	1,600	400	100	40
Ring-necked	110	350	350	300	200	200	200	150	40	40
Canvasback	110	350	450	450	400	350	350	300	100	20
Scaup	2,700	3,300	3,500	3,000	2,000	3,300	5,100	3,100	1,000	275
Goldeneye	100	100	100	100	200	200	300	400	500	600
Bufflehead	1,330	1,750	1,900	1,100	600	500	450	400	360	150
Ruddy	900	2,000	2,000	1,500	1,000	800	500	400	100	25
Other Mergansers	100	200	200	200	100	100	150	150	150	50
Total Ducks	81,450	92,250	97,100	86,350	69,400	56,900	48,000	36,980	27,500	15,750
Coot:	20,150	24,600	31,500	26,750	18,650	15,000	11,050	7,095	4,050	100

3 -1750a

Cont -1
(Rev. March 1953)WATERFOWL
(Continuation Sheet)REFUGE Red Rock LakesMONTHS OF September TO December, 1968

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total
	11/10-16 11	17-23 12	24-30 13	12/1-7 14	8-14 15	15-21 16	22-28 17	18		
Swans:										
Whistling									28,000	
Trumpeter	225	260	268	260	260	259	249		28,063	
Geese: Total Swans	225	260	268	260	260	259	249		56,063	
Canada	50	40	30	30	30	30	30		19,110	
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Blue Total Geese	50	40	30	30	30	30	30		19,110	
Ducks:										
Mallard	2,465	560	300	300	260	200	200		993,895	
Black										
Gadwall	185	80	20	30	30	20	20		463,645	
Baldpate	1,260	400	345	110	80	80	80		1,662,535	
Pintail	50	25							302,225	
Green-winged teal									25,410	
Blue-winged teal									61,710	
Cinnamon teal										
Shoveler	20								80,850	
Wood										
Redhead	25		10						364,525	
Ring-necked	10	5	5						13,720	
Canvasback	10								20,230	
Scaup	100	100	100	100	100	100	100		195,825	
Goldeneye	700	700	700	900	900	1,000	1,000		59,500	
Bufflehead	100	50	10						60,900	
Ruddy	25	20	10	10	5				65,065	
Other Mergansers									9,800	
Total Ducks	4,950	1,940	1,500	1,450	1,375	1,400	1,400		4,379,865	
Coot:									1,112,615	

(over)

	(5)	(6)	(7)	SUMMARY
	Total Days Use :	Peak Number :	Total Production :	
Swans	56,063	1,745		Principal feeding areas <u>All water, marsh and swamp areas.</u>
Geese	19,110	450		
Ducks	4,379,865	97,100		Principal nesting areas <u>None this quarter.</u>
Coots	1,112,615	31,500		
				Reported by <u>Owen H. Fivion, Refuge Manager</u> <u>John T. Annear, Refuge Biologist</u>

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1751

Form NR-1.

(Nov. 1945)

MIGRATORY BIRDS

(other than waterfowl)

Refuge Red Rock LakesMonths of September to December 1968

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Common Loon										
Red Necked Grebe										
Horned Grebe	Previous period		Peaked during last period		2	10/8				150
Eared Grebe					6	10/8				400
Western Grebe					5	9/24				175
Pied-billed Grebe					2	9/24				50
White Pelican					10	10/8				50
Double-crested Cormorant										
Great Blue Heron					3	11/5				150
Black Crowned Night Heron					2	9/24				70
American Bittern					1	9/24				25
Sandhill Crane (Greater)					2	10/4				250
Virginia Rail										
Sora										
II. Shorebirds, Gulls and Terns:										
Killdeer	Previous period		Peaked during last period		4	10/22				400
Common Snipe					2	10/30				300
Willet					5	9/17				125
Greater Yellowlegs					2	9/17				40
Lesser Yellowlegs					1	9/17				30
Long-billed Dowitcher					4	10/8				65
American Avocet					2	10/17				100
Wilson's Phalarope						10/8				1,000
Northern Phalarope						10/8				200
California Gull					15	11/8				250
Ring-billed Gull					9	11/8				250
Forester's Tern					12	9/17				50
Common Tern					8	9/17				50
Black Tern					2	9/17				50

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	Previous period	Attained last period	4	10/11	30
White-winged dove					
IV. Predaceous Birds:					
Golden eagle	Observed throughout period				5
Duck hawk (Peregrine Falcon)	"	"	"		6
Horned owl					
Magpie	Resident	Attained last period	Still present		250
Raven	Previous period	"	"	"	25
Crow	"	"	"	"	100
Red-tailed hawk	"	"	"	Still present	15
Swainson's hawk	"	"	"	"	10
Rough-legged hawk	"	"	"	"	5
Ferruginous hawk	"	"	"	"	5
Bald eagle	3	9/26	7	10/30	10
Marsh hawk	Previous period	Attained last per.	"	"	15
Prairie Falcon	Observed throughout period				10
Sparrow hawk					35
Great horned owl	Resident			Reported by John T. Annear	30
				Biologist	

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1750c
Form NR-7
(Sept. 1960)

WATERFOWL WINTER KILL SURVEY

Refuge Red Rock Lakes

Year 1968

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
10/5-11	31	186	Mallard (7), Gadwall (8) Widgeon (34) GW Teal (3) Cinnamon Teal (6) Shoveler (13) Red head (2) Canvasback (6) Scaup (23) Bufflehead (2) Goldeneye (3)	107	53	160	48	247
10/12-18	14	84	Mallard (5) Gadwall (6) Widgeon (17) Pintail (1) Cinnamon teal (1) Shoveler (2) Red head (2) Canvasback (1) Scaup (12) Bufflehead (1) H. merganser (1) Canada goose (1)	50	25	75	37	198
10/19-25	5	30	Mallard (2) Gadwall (3) Widgeon (8) Scaup (4) Goldeneye (2) Canada goose (1)	20	10	30	5	30
TOTALS	50	300	Mallard (14) Gadwall (17) Widgeon (59) GW Teal (3) Cinnamon teal (7) Shoveler (15) Red head (4) Canvasback (7) Scaup (39) Bufflehead (3) Goldeneye (5) H. Merganser (1) Canada goose (2)	177	88	265	90	475

(over)

INSTRUCTIONS

- (1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.
- (2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.
- (3) Record the total number of hours the hunters spent hunting on the refuge.
- (4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).
- (5) Record total numbers of waterfowl bagged.
- (6) Record total numbers of waterfowl reported knocked down but not recovered.
- (7) Total of Columns 5 and 6.
- (8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).
- (9) Kill sample projected to 100 percent. $\text{Column 9} = \frac{\text{Column 8}}{\text{Column 2}} \times \text{Column 7}.$

3-1752
Form
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Red Rock Lakes Months of September to December, 19 68

(1) Species	(2) Density		(3) Young Produced	(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'd. Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Blue grouse	Coniders 3,000 acres							20	Use along south refuge boundary.
Ruffed grouse	Aspen-fir-willow 3,000 acres							85	
Sage grouse	Sagebrush-grass 3,000 acres							75	Birds moved on and off northern portions of the refuge.
Gray partridge (Hungarian)	Sagebrush-meadow 24,000 acres							20	All census work carried out through random observations in connection with other duties.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- | | |
|---------------------|--|
| (1) SPECIES: | Use correct common name. |
| (2) DENSITY: | Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks. |
| (3) YOUNG PRODUCED: | Estimated number of young produced, based upon observations and actual counts in representative breeding habitat. |
| (4) SEX RATIO: | This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available. |
| (5) REMOVALS: | Indicate total number in each category removed during the report period. |
| (6) TOTAL: | Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons. |
| (7) REMARKS: | Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested. |

* Only columns applicable to the period covered should be used.

3-1753
Form No. 3
(June 1945)

BIG GAME

Refuge Red Rock Lakes

Calendar Year 1968

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions	(7) Estimated Total Refuge Population		(8) Sex Ratio
			Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss		At period of Greatest use	As of Dec. 31	
Common Name	Cover types, total Acreage of Habitat	Number								Number	Source		
Black Bear											2		
Elk			3								70		
Mule Deer			4								110	50	30 M 100 F
Moose		7	4								40 15 April	15	74 M 100 F
Antelope		130	12								325		65 M 130 F 130 Y

Remarks:

Reported by John T. Annear, Biologist

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.
- (2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated total number of young produced on refuge.
- (4) REMCVALS: Indicate total number in each category removed during the year.
- (5) LCSSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.
- (7) TOTAL REFUGE POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) SEX RATIC: Indicate the percentage of males and females of each species as determined from field observations or through removals.

REFUGE GRAIN REPORT

Refuge Red Rock LakesMonths of January through December, 1968

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Barley	2,000 bu.	2,100 bu.	4,100 bu.			1,750 bu.	1,750 bu.	2,350 bu.		2,350 bu.	
Dutch White Clover (trifolium repens)	500 lbs.		500 lbs.					500 lbs.	500 lbs.		

(8) Indicate shipping or collection points Via Regional Transport(9) Grain is stored at MacDonald Pond, Culver Pond(10) Remarks Barley received from Kootenai National Wildlife Refuge.

*See instructions on back.

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.
- (4) A total of columns 2 and 3.
- (6) Column 4 less column 5.
- (7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters granary," etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

DATE	OF PERIOD BEGINNING ON HAND	PERIOD RECEIVED	TOTAL	DISPOSED OF				TOTAL	DISPOSED OF	TOTAL	DISPOSED OF
				SHIPPED	TRANSFERRED	FEED	OTHER				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

Information sign erected in public fishing area. These signs were obtained from the US Forest Service sign shop in Missoula, Montana. They are made of 3/4 inch marine plywood with incised lettering. Entire sign was plastic coated after painting.



Sparrow Pond

New impoundment approximately 15 surface acres - developed at the head of Sparrow Slough immediately east of the refuge airstrip. The pond dike provides a roadway into the eastern part of grazing unit 5.

The pond received heavy duck use all season long. One pair of swan were interested but did not nest this year - maybe next.

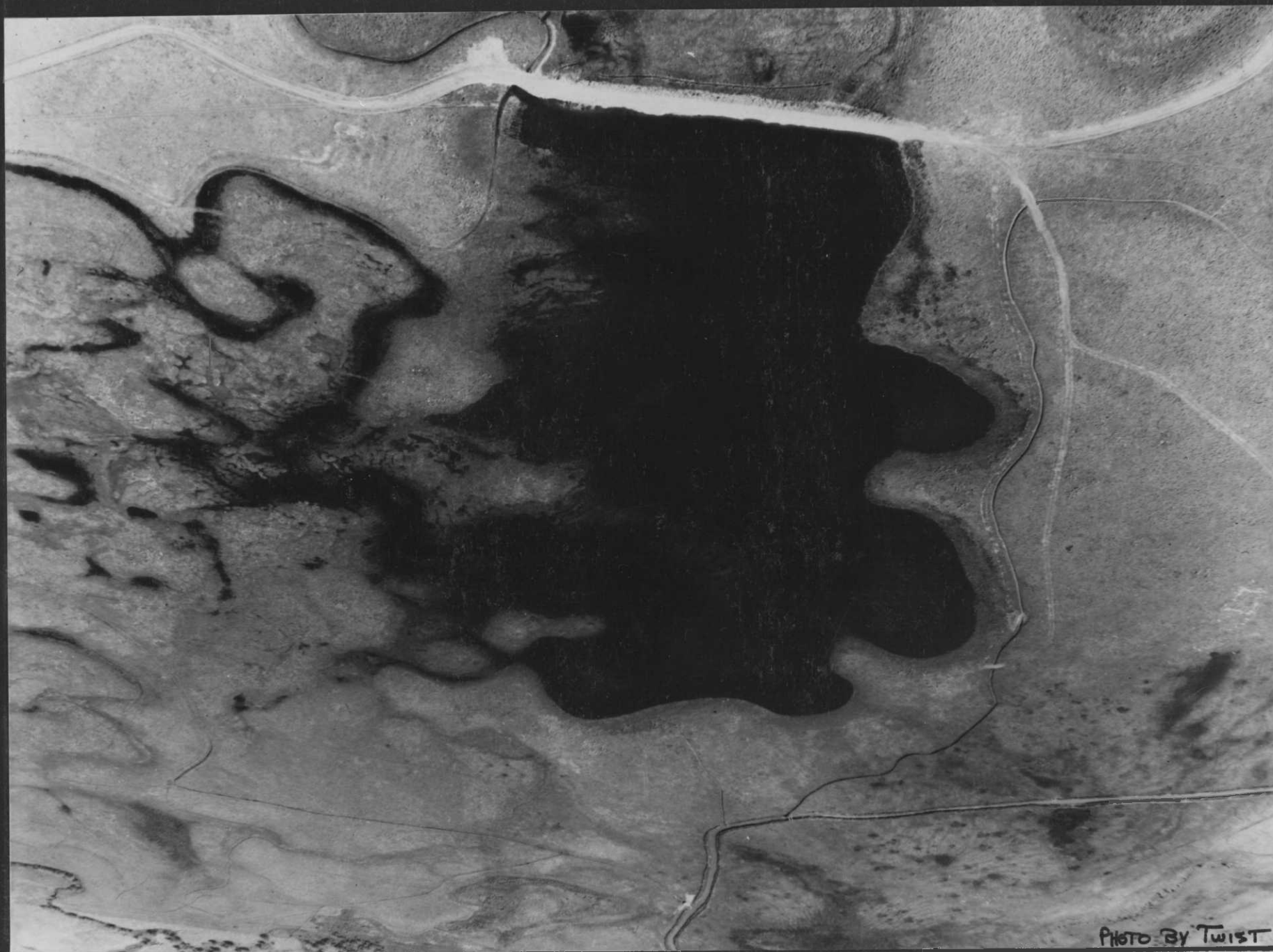


PHOTO BY TWIST

Years Major Work Program

1. The Problem - Streambank erosion on Red Rock Creek west of Elk Lake Road. In upper photo one 7 cubic yard load of rock experimentally placed. In some stream sections erosion was severe (upper photo) in other areas eroding banks were trying to heal naturally.



2. The Solution - Rock rip rap placed to provide solid barrier in areas of severe erosion. In upper photo rip rap in this section was leveled by small dozer. This proved time and material consuming and provided no added benefit.

In lower photo rock was dumped over bank so as to form the desired solid wall of rip rap.



3. Upper photo - working on unstable banks with 5 and 7 cubic yard loads was a bit hairy but precautions taken prevented any mishaps.

In areas where erosion was not severe a solid wall of rip rap seemed unnecessary so we placed loads of rock to help reduce current pressure on the eroding bank. We may have to go back and fill in the open spaces left between dumps of rock. We are in hopes the eddies created between the rock piles will encourage willow and other plant growth.



23

DATA SHEET

RED ROCK LAKES NATIONAL WILDLIFE REFUGE
Monida, Montana 59744

- General: The scenic 39,943 acre Red Rock Lakes Refuge provides the most important breeding and wintering grounds for the rare trumpeter swan; secondary objectives provide breeding, feeding and resting habitat for ducks, geese, and other wildfowl and for the last indigenous population of the rare grayling fish south of Canada. Shiras moose, deer, antelope, and occasional elk are resident big game species. Public use totals about 6,000 annually.
- Location: Centennial Valley in southwestern Montana. Headquarters 28 miles east of Monida (pop. 14); 98 miles south and east of Dillon (pop. 3,000); 115 miles north and east of Idaho Falls, Idaho (35,000 pop.); and 48 miles west of West Yellowstone.
- Elevation and Climate: Elevation is about 7,000 feet. Centennial mountains rise abruptly to 10,000 feet to the south, with the Gravelly Range bordering the valley to the north. Moderate summers, rather severe winters, with 135" average snowfall.
- Hours of Duty: Normal tour of duty: 8:00 a.m. to 5:00 p.m. Monday through Friday. Weekend detail during summer months to handle inquiries and emergencies.
- Travel: Occasional overnight travel for routine procurement. Valid state driver's license required; employees required to pass a road test to obtain Government driver's license.
- Housing: Government quarters available; stoker furnace heat; stove and refrigerator furnished. Telephone service available at employee's expense.
- Schools: Public grade school one-half mile from headquarters; public high school in Lima, Montana, 42 miles distant; no school bus service. Teachers' college in Dillon.
- Churches: Catholic, Mormon, non-denominational in Lima; Protestant churches in Dillon and Idaho Falls.
- Shopping and Medical Facilities: Groceries available in Lima; most shopping is done at Dillon or Idaho Falls; medical and hospital facilities at Dillon or Idaho Falls.
- Transportation: Intermountain and Greyhound bus service and Union Pacific rail service to Monida. Frontier, Western and West Coast air line service to Idaho Falls.
- Recreation: Fishing and hunting. TV service (employee must furnish own antenna). Movie theaters at Dillon and Idaho Falls. Yellowstone National Park approximately 50 miles east.

(Prepared for the benefit and convenience of prospective employees on basis of best information available in January 1965. Variable information subject to change and cannot be guaranteed by the Bureau. Current data can be obtained from the Manager of the station at the above address.)



Now you see it...

and...



now you don't !



Two of the major
construction
projects which
took place
this past year:

Upper-installation
of a new springbox
at the
campground-picnic
area

Lower-preliminary
work on the
installation
of a 5 foot
Parshall flume
in the
Mallard Canal



One of the local ranchers thought he might have some troubles with a black bear cub which had an eye for his chickens, but when he shot it and got a good close look at the critter, it turned out to be a



Red Rock Lakes Refuge provides many hours of Hunting; it also provides a few minutes of Finding. Refuge Mechanic Hotchkiss (the one heeding that sage advice "take the bull by the horns") and Dan Sullivan, local rancher, were two of the fortunate few to outwit the wily Elk.



Just
a
small

Headquarters.
to the
entrance

chore known locally as "spring cleanin'". This is the main



Title: "Who sez Refuges ain't got modern farmin' equipment?"
or
"I wish you'd put a basket on that damned lawnmower."

Cast: "Mario Andretti" Hotchkiss - Pilot
"Ben Hur" Hotchkiss - Charioteer

Scene: The Refuge lawn



photo by McLaury

Demonstrating our aerial techniques for Trumpeter swan nesting studies. Readily visible is a swan on a nest, and its mate in the sedges just above. It has been noted that even though the aircraft (in this case, two) flies quite close very seldom will a swan vacate the nest.



photo by Annear

You've heard the old saying, "Let's give it back to the Indians"? Well, here we are doing our share. This load of surplus weasels was picked up by the Fort Hall Indian Reservation.



photo by Duncan

Trumpeter swans transported to Salt Lake City for shipment to various zoos earned a rest-stop at the Bear River Research Station. Biologist Annear has just subdued 30 pounds of flapping wings and feet, and is about to depart to the operating room for removal of a 10cc blood sample. (Not me Doc, the swan!)

**FISH AND WILDLIFE SERVICE
Bureau of Sport Fisheries and Wildlife**

For Release December 8, 1968

Omroff 343-5634

**TRUMPETER SWAN NO LONGER RARE AND ENDANGERED,
SPORT FISHERIES AND WILDLIFE REPORTS**

The trumpeter swan is no longer a "rare wildlife species" because of a successful conservation program, Director John S. Gottschalk of the Department of the Interior's Bureau of Sport Fisheries and Wildlife said today.

"Trumpeters are now located in several widely scattered geographic areas and their environments are not seriously threatened," Dr. Gottschalk said. "This swan is, therefore, no longer in danger of extinction, nor can it be considered rare according to the definition in the Bureau's Red Book of Rare and Endangered Fish and Wildlife in the United States."

Bureau biologists counted 3,641 trumpeters in the United States during their 1968 fall aerial survey and concluded that the total population probably is between 4,000 and 5,000. Additional trumpeters are in Canada.

At one time these majestic birds were eagerly sought by feather traders and others were shot for meat. In 1932, only 69 trumpeters were left in the 48 contiguous States. These were in the Yellowstone-Red Rock Lakes-Jackson Hole region of Montana, Idaho, and Wyoming.

The Red Rock National Wildlife Refuge in Montana was established in 1933; transplants to other refuges began in 1939.

During the recent survey, trumpeters were seen in South Dakota (76), Oregon (51), Washington (37), Nevada (34) and Minnesota (16). All of these are transplants or offspring of transplants. Except in Minnesota, all were on or near national wildlife refuges.

Counts in other States were: Alaska (2,842), Montana (365), Wyoming (126), and Idaho (94).

In addition, about 50 zoos in the United States now have this swan. Some trumpeters have lived 30 years in captivity; their life span in the wild is unknown.

"This is an example of conservation interests bringing about an action program that successfully prevented the loss of one of America's greatest wildlife species," Dr. Gottschalk said, "and we are proud of the role our refuges have played in this restoration."

The Federal wildlife chief said that special restrictions on the display, propagation, sale and exchange of trumpeters held by private institutions are no longer needed.

But he added: "We will continue to monitor swan populations, and we intend to increase our efforts to restore trumpeters in appropriate parts of their former breeding range."

Trumpeters are the largest North American bird in terms of weight. Males sometimes reach 30 pounds. Whooping cranes are taller, but weigh only about 17 pounds. Trumpeters are appropriately named because their calls are loud and resonant, reminding some observers of a trumpet and horn fanfare of a symphony.



Butterflies are interesting in other ways too. Some species have "sleeping assemblies" where they gather together late in the day and sleep together. Then there are the "mud puddle clubs" where butterflies pack close together by the hundreds on the damp soil around a mud puddle. Some believe that butterflies have certain "flyways" that are consistently used by local traffic.

Many species have definite odors. Some are spicy, some delicate and sweet, others strong and musky.

Territories are important for certain kinds of butterflies. These are the notoriously pugnacious varieties, which chase away other butterflies, other insects and even birds, dogs and people. The pearl crescent is best known for these tactics.

Color seems to play a very important role in the life of a butterfly. To some, protective coloration is essential to their very existence. The varieties with *resemblance colorations* imitate a dead leaf, a bud or a bird dropping. Plain-colored varieties often resemble the backgrounds of their habitat like green or yellow leaves.

Some species have a combination of dull coloration while at rest and bright colors in flight. This is to confuse the pursuer. Those that are brightly colored all over may be the kind that eat poisonous plants and advertise their inedibility with *warning coloration*.

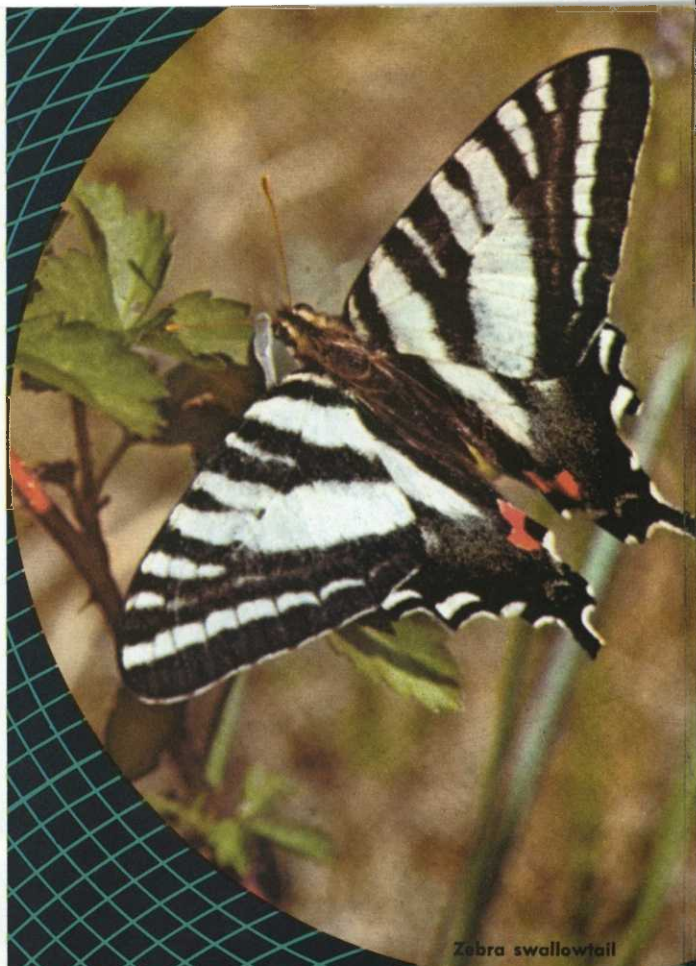
Butterflies use *mimicry* too. The monarch, for example, is genuinely inedible. It advertises this fact with its lovely warning colors. The viceroy, which is good bird food, looks very much like the monarch and enjoys the protection provided by its less-tasty cousin. Other escape devices include rapid and erratic flight, dodging and hiding.

Most butterflies are vulnerable to predators during every stage of their lives. Chief among their adversaries are birds, lizards, toads and frogs, and predatory insects. But in their plight butterflies provide an important link in the food chain. By eating plant food, they provide a necessary food supply for others.

But eating and being eaten is not the only role butterflies play in the community of nature. Many carry pollen from one plant to another and in this way assure the propagation of those plants. Butterflies also help to keep other insects in check. The harvester butterfly caterpillar, for example, eats plant lice. But it works the other way too. The azure butterfly caterpillars act as "cows" for ants by giving off a sweet liquid.

Man's destruction of natural environment has even affected the butterfly. One species, the regal fritillary, is in danger of extinction as the result of the disappearance of the native prairie. Once found from New England to Colorado, and from Southern Minnesota to Northeastern Oklahoma, this large orange and blue butterfly is now confined to the Great Plains of Kansas. Here, the food of the butterfly's caterpillar, the prairie violet, is making its last stand... and so is the regal fritillary.

But, happily, most butterflies are still a common sight in every garden. Some of them are every bit as pretty as the flowers they visit. In fact, on a good butterfly day one might get the feeling that the flowers have taken wing and are dancing gaily about the world. □



Zebra swallowtail

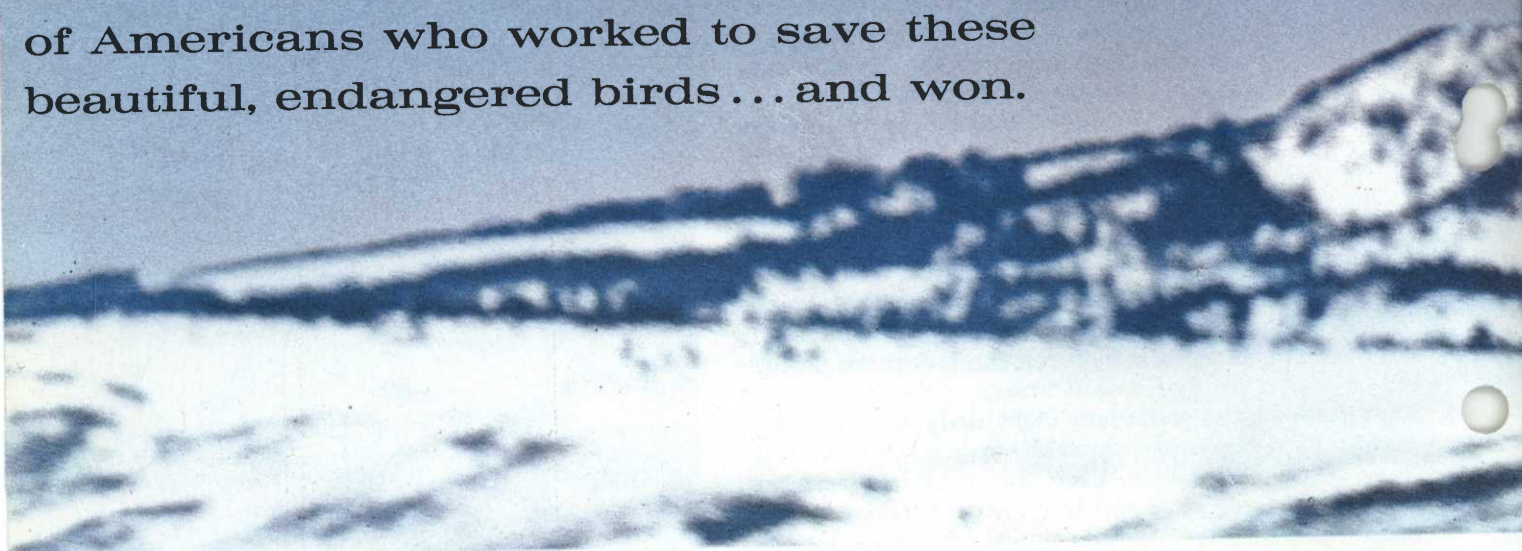


Eastern tailed blue

TRIUMPH OF THE TRUMPETERS

by Robert Murphy

One of conservation's greatest success stories was written by the thousands of Americans who worked to save these beautiful, endangered birds...and won.



IN THE LONELY WILDERNESS of southwestern Montana, some 40 miles across the Continental Divide from the town of West Yellowstone, lies the wild and spacious Centennial Valley. Surrounded by snow-capped mountains rising to 10,000 feet, the valley itself nestles at 6,600 feet above sea level, and contains great marshes, three shallow blue lakes, and several sparkling streams inhabited by big rainbow, brook and cutthroat trout and some of the last native grayling in the contiguous United States. It is a beautiful and untroubled spot.

It is here that one of the rarest and most beautiful of waterfowl, the wild trumpeter swan, lives and multiplies in Red Rocks Lakes National Wildlife Refuge. Once near extinction, with only 73 birds left in the United States, the trumpeter made its last stand in Centennial Valley, where waters warmed by thermal springs spared it the hazards of migration. Protected there since 1937, they have now increased to a flock of several hundred, and their stock has been reintroduced to Oregon, Nevada, Wyoming and South Dakota. The deliverance of this great bird from the brink of final annihilation is one of the most heart-warming stories in the history of wildlife conservation.

There was a time when the trumpeter ranged over much of the central part of the continent — from Alaska to Iowa, Missouri and Indiana — and wintered in vast numbers in the Ohio and Mississippi valleys, along the Gulf of Mexico, and in the lower Columbia River. Occasionally it was seen even on the Atlantic Coast.

In earlier years, the Indians and Eskimos caught and killed some of the birds, and natural enemies such as eagles and coyotes sometimes made off with the baby swans or cygnets, but the trumpeter was able to withstand these drains. It was the white man who brought this handsome creature almost to extinction. Tender young swans were relished by the pioneer settlers as a pleasant change from a steady diet of deer and buffalo, and the fur trade soon learned that swan skins and quills were a lucrative commodity in the market place. Trumpeter down made the best powder puffs, quilts and featherbeds, and the quills, which are very hard but elastic, were perfect for pens.

A price on their skins. Market hunters and settlers killed thousands of trumpeters and whistlers in all seasons of the year. The Hudson's Bay Company alone sold



Photograph by Robert C. Twist

17,671 swan skins in London between 1853 and 1877, and it is probable that most of these were from trumpeters. There are no figures on the vast numbers sold in this country and abroad by other companies and individuals.

Moreover, around the turn of the century, a great demand developed for these spectacular birds for zoos, private collections, parks and estates. The young were run down and captured in September before they could fly; they brought \$50 a pair, a comfortable sum in those days, and were shipped all over the United States and across the Atlantic. Residents of Montana's Red Rock Lakes country developed such a thriving business in baby swans that they managed to talk the market hunters into sparing some breeding pairs. It is quite possible that this is partially responsible for the fact that the trumpeters survived at all.

In 1900 market hunting was outlawed by Federal statute, and the adoption of the Migratory Bird Treaty Act with Great Britain in 1918 ended all hunting of swans. But these measures came almost too late to save the trumpeters. In 1912 the famous ornithologist, Edward Howe Forbush, wrote sadly: "The Trumpeter has succumbed to incessant persecution in all parts of its range,

and its total extinction is now only a matter of years."

Three years after this dismal prophecy was published, several trumpeters were seen in Yellowstone Park, and in 1919 two mated pairs were reported living in the park, but nothing was done immediately to encourage them. In 1922 a biologist from the Biological Survey (now the Bureau of Sport Fisheries and Wildlife) visited Red Rock Lakes and recognized the desirability of buying the area as a refuge for the diminishing trumpeters that lived there. This move was quickly squashed by several influential duck-hunting clubs which enjoyed fine shooting at Red Rock Lakes.

Trumpeter survey. Finally, in 1929, the National Park Service began a series of scientific studies of animals and birds in the parks, including the trumpeters in Yellowstone. The trumpeter survey was far from encouraging. It noted heavy egg loss and a very high mortality among the cygnets from predators and other adverse conditions. Moreover, once frightened by anything such as gunfire—even though the shooting was not at them—the trumpeters remained suspicious and flighty for three or four years.

Concern mounted among the conservationists, and a team was appointed especially to study the trumpeters and do what it could to save them. It consisted of George Wright and Ben Thompson, Park Service biologists, and Dr. Joseph Dixon of the University of California. They were strongly supported by Roger Toll, Yellowstone superintendent.

About this same time, ranchers in the Red Rock Lakes country reported to Park authorities that hunters were shooting swans as well as ducks. Wright wrote many letters to duck-hunting clubs, pleading for mercy for the swans. The Montana Fish and Game Department was persuaded to post a reward payable to anyone who furnished information about swan shooters. In 1931, Dr. Dixon published an effective article about the plight of the trumpeters in *American Forests*, and for the first time the public was aroused.

Meantime the authorities in Yellowstone Park set up a predator control system, to reduce the population of coyotes and ravens and give the baby swans a chance. Some of the Park's fishing waters near the trumpeters' nests were closed to the public, and Supt. Toll relocated a main road then under construction to provide a buffer zone between the nesting swans and Park visitors.

Ding did it. But it was J. N. (Ding) Darling, famous cartoonist, militant conservationist, and first president of the National Wildlife Federation, who really saved the swans. For many years, through his cartoons and eloquent speeches, he had publicized the cause of wildlife conservation and tirelessly flagellated the despoilers. In 1934 he was appointed Chief of the Biological Survey, and soon thereafter he visited Red Rock Lakes and promptly insisted that a refuge must be established there for the trumpeters. The hunting clubs were still around, but this time they lost. They were no match for the determined and influential Ding. The Red Rock Lakes Refuge finally became a reality in 1935.

Even so, it seemed that the swans' troubles were not entirely ended. The Army now decided to set up a mountain training and artillery center near Henry's Lake in Idaho, where the trumpeters often appeared. Biologists knew from their studies that the roar of artillery would frighten the birds and make them wary of the whole mountain area where they lived. With the support of powerful conservationist groups, Refuge and Park authorities persuaded the Army to take its noisy training ground elsewhere.

It was also found that some trumpeters were still being shot illegally outside the Refuge, particularly in Idaho. A group called The Emergency Conservation Committee, headed by Rosalie Edge of New York, raised enough money to hire a lecturer, who spent two years in the mountain country stirring up the local citizens and persuading them to leave the swans alone. The lectures were heard by more than 24,000 people and were so effective that at last the shooting virtually ended.

At the time the Red Rock Lakes Refuge was established, in 1935, the Biological Survey reported that 46 of the 73 trumpeters left in this country made their home at Red Rock. Rigorous protection turned the tide, and slowly the great birds began to multiply. In 1966 aerial

surveys counted 878 wild trumpeters in the contiguous United States, 417 of them in Montana. It is believed that there are also about a thousand in Western Canada and Alaska, and 84 live in captivity in the United States.

Thus the trumpeter swan is one of the very few threatened species in this country to be re-established in a substantial way. Everyone has read of the tragic extermination of the passenger pigeon and the present touch-and-go struggle to save the whooping crane.

Inaccessible refuge. Early in May of 1966, my wife and I drove into the Red Rock Lakes Refuge to do a bit of research for a book I am writing on the wildlife preserves of this country. Red Rock is one of the most inaccessible of our refuges. The few people who live in the region drive 100 miles for supplies or to go to a movie, and at times they can't get out at all.

Winters come early and are severe. The temperature can plunge to 20 or 30 degrees below zero, and snows are deep. In the spring the dirt and gravel road is muddy and often almost impassable. Indeed, we were advised by people on the "outside" not to attempt the trip until the summer months. But we made it, and it was well worth the effort.

The Red Rock country is one of our unspoiled wilderness areas. Moose sometimes stroll along the road, and the tracks of an occasional mountain lion can be found in the spruces and aspens below timberline. The scenery is superb, and the solitude is a pervading presence.

Soon after we arrived, Eldon McLaury, wildlife management biologist, then acting refuge manager, took us to the edge of one of the lakes for our first glimpse of the swans. Among the ducks on the water was a pair of trumpeters — big, gleaming white birds floating with the special grace that characterizes all swans and has made them a favorite in zoos, parks and estates for hundreds of years. They weren't very far from shore. Indeed, this is one characteristic of the trumpeter that made it so vulnerable to the market hunters in earlier days. The whistling swan, our other native, which is a close cousin





of the trumpeter but somewhat smaller, has always gathered in flocks far out on large lakes, but the trumpeter likes to swim along shorelines and so often came within range of the blinds.

Serene and untroubled by our presence, this pair of trumpeters swam slowly away with their long necks erect and their heads held high. They and the whistling swan both carry themselves in this way. It is only the mute swan of Europe that curves its neck and sometimes carries its wings raised somewhat.

Adult trumpeters are the largest of our waterfowl. They have a wingspread of seven feet or more, are about five feet long, and attain a weight of 35 pounds. So shining white is their plumage that in flight they can be seen at a great distance. They have black bills and feet; they lack the yellowish spot before the eye that distinguishes the whistling swan from the trumpeter. The whistler has a high-pitched, barking whistle that gives it its name, while the trumpeter has a deep and resonant call, low, clear and trumpetlike, that is caused by an extra loop of the windpipe in the breastbone. Young trumpeters sound like toy trumpets.

The Kootenai Indians called the trumpeters "Ko-Hoh", which, when pronounced gutturally, sounds like their call, but they have a wide vocal range and can be heard a mile or more away. William E. Banko, a former manager at Red Rock Lakes, who has written a fine authoritative study, *The Trumpeter Swan*, and knew the great birds the year round, says that in fall and winter when they are gathered in flocks they are noisy and sometimes they participate in what might be called song-fests that build in volume to a crescendo and end in long wailing notes. Heard on moonlight nights and softened by distance, these vocalizations are one of the most stirring sounds in nature.

Graceful fliers. Trumpeters are fast swimmers, able to outdistance pursuit in rowboats or canoes. Despite their size, they are strong and graceful fliers, and although they use a slow wingbeat they are swifter in the air than some of the ducks. They get into the air with a flapping run over the water's surface, fly with their necks extended and their feet tucked under their tails, and often reach considerable heights. When they land on the water again, they glide majestically down, spread their feet before them and coast on their broad webs like skiers until they lose way. When moving any distance they fly in angular lines, and their size, color and grace make their flight a beautiful thing to see — but also brought death to many of them. They were so striking that when they appeared

every hunter in the vicinity went out after such a prize.

They float buoyantly on the water when undisturbed, as when we saw them, but can sink low when danger threatens. When basking quietly afloat in the sunshine, they have a curious habit of drawing one extended foot up toward the back. They prefer being water-borne although they spend considerable time ashore preening, and the baby trumpeters leave the nest for the water as soon as their gray down is dry.

The mature birds, which are thought to mate for life, are quite aggressive when they have eggs or young and because of their size and strength are dangerous to approach. They take very good care of their families, guiding the young over a wide territory to exercise and feed on tender water plants. Hatched in June, from eggs that weigh half a pound, the cygnets are ready to fly in October, and their parents get them into the air by flying low several hundred feet ahead of them and calling encouragement. The cygnets follow excitedly, running over the water and beating their wings until at last they are airborne.

Trumpeters build huge nests, five or even six feet across, usually of marsh plants torn up in the vicinity, often on top of muskrat houses. The Refuge swans seem to prefer a screen of sedges or bulrushes between their nests and open water, but I saw several trumpeter nests in Alaska that were built on open points of land on the lonelier Kenai lakes. The female or pen, as it is called, is thought to do all the incubating, which takes about 35 days; when she leaves the nest to feed she covers her eggs with down and plants. The male or cob stays on guard nearby and warns his mate of approaching danger with a sharp trumpet call.

Migration ceased. Somewhere along the way, in the midst of the horrible beating they were taking from the hunters' guns, a remarkable thing happened to the trumpeters. They quit migrating. They simply retreated to the remote fastnesses of the West and stayed there summer and winter.

At Red Rock Lakes there are several warm springs that remain open all winter, and the Refuge managers have now impounded them, so that there is enough open water to harbor these great birds even when the temperature plunges to 25 below. Some trumpeters make short flights of about 100 miles around the area, but the long migrations of thousands of miles seem to be a thing of the past.

Although the law now sternly forbids the shooting or trapping of trumpeters, there are still a few poachers and trophy hunters who are willing to take a chance. Moreover, there is another danger when the trumpeter leaves its wilderness home. The Refuge people who have worked with these birds vow that they have an almost suicidal predilection for flying into the side of a barn or other obstruction or hanging themselves on fences and telephone wires. "Give them half a chance," said one Refuge executive unhappily, "and they'll kill themselves."

Until 1965 no trumpeters had ever bred in captivity in this country. In that year a pair in the Philadelphia Zoo and another pair at Great Bend, Kansas, each hatched five cygnets. Life in captivity has caused some odd



changes in the behavior of the swans. Some of the changes are interesting and amusing and are in direct opposition to the things they do in the wild. The parents of the Philadelphia cygnets, far from maintaining the usual strict monogamy that holds in the wild state, are not a pair but a trio and have flouted their ancient habit by establishing a *menage a trois* in which the male courts both females.

Color markings. In 1966, in order to observe this phenomenon, the curator, John A. Griswold, put a red plastic collar on one female or pen, and a yellow collar on the other. Again the male courted both females in the Zoo lake where they live with a variety of other waterfowl. Neither pen seemed jealous of the other, and there was no vulgar strife or squabbling. Presently all three were cooperating in amity to build a nest from the ten bushels of wood chips and cut weeds supplied them.

The first egg was laid on May 1, 1966, apparently by the yellow-collared pen. The red-collared female was first seen sitting on the nest on the 8th, by which time there were four eggs. Yellow-collar did almost all the incubating — except several times when red-collar sat and

strangely enough the cob unconventionally sat for a while. On the 12th red-collar laid *her* first egg. All the trumpeters began to get aggressive about this time.

On the 14th the pens took turns sitting on the nest, and then things grew confused. What appeared to be a half-hearted attempt at a second nest, about 18 inches from the first one, was in evidence on the 18th and had one egg in it. The Zoo attendants built it up and placed three false eggs in it. By the 19th there was a pen on each nest, with a total of 12 eggs in the two. The next day the pens began to swap eggs; the original nest held five and the new nest seven and the three falsies, and by afternoon the nests seemed closer together. On the 22nd the pens changed nests, and the thirteenth egg appeared. Later that day there was one big nest, with the two pens sitting calmly side by side.

They began to steal each other's eggs again. On the 23rd, yellow-collar had eleven eggs, red-collar two; the next day they had five and eight, and the day after that red-collar had them all. On the 26th yellow-collar had all of them and kept them on the 27th. By the 30th they divided eggs again, yellow-collar taking three and red taking eight (two having been lost in the meantime).



Photograph from the United States Fish and Wildlife Service

This continued until June 9, when red-collar took over completely. On the 10th they took turns sitting.

The first cygnet hatched on the 13th and was taken by the attendants to the bird-house to be hand-raised for a while. By this time five eggs had either disappeared or had been removed because they had gone bad, and the pens were taking turns incubating the eggs that were left. Another cygnet hatched on the 16th and was left with the pens, and they took turns incubating and brooding the baby. It didn't get into the water as quickly as wild cygnets do; perhaps it was confused by so many mothers. Finally, the red-collared pen took the cygnet swimming, and while ashore it sat first with one pen and then with the other; several days later all three of the old swans swam with it together. On the 20th both pens lost interest in the nest and deserted it. The remaining eggs were never hatched.

They brought it off. The incubator cygnet was introduced to the family but didn't seem to identify with it at first; it tended to wander off. But eventually the incubator cygnet joined the family. With the reunion accomplished, the family stayed together, and all three

adults watched out for the youngsters henceforth. The unconventional trio, with some human help, had brought it off. No one knows what their wild brethren would have thought of all these scandalous goings-on.

With the continued healthy growth of our flocks of wild trumpeters, some of them are now being moved from Red Rock Lakes to other protected areas, and it is hoped that eventually it will be a bit easier for the public to see these great birds. They are a spectacle well worth a long journey. To see them, knowing their story, is to recall in fuller measure the place that all swans hold in legend, fairy tale and folklore — a place that made the mute swan of Europe, as early as the 13th century, a special ward of the king.

It is doubtful, however, if ever again we will see great strings of wild trumpeters move majestically far across the sky, as they did in the early days of our country. There is no longer enough breeding habitat left to breed them in such numbers. It is our loss, for they are big and beautiful, and their voices are stirring. Yet it is better to have them where they are, in seclusion, than not at all. We should be grateful that the trumpeter still exists on this teeming earth. □



TURTLE-TOTIN' TIME

by Helen Ward Gall

It's sulphur and molasses time —
the dogwood is in bud!
The frost has gone and left the earth
a soft, warm sea of mud;
The artist gets his easel out,
the poet starts to rhyme:
It's springtime in the country,
and it's turtle-totin' time!

It's moving time — all nature stirs;
the captive brook flows free;
The turtle stretches in the sun
and sets forth leisurely
Upon a busy thoroughfare,
across my hurried way.
"It's turtle-totin' time again —
it must be Spring!" I say,

And stop my car to pick him up
and carry him across
To safety on the other side,
upon the cool, green moss.
What matter if I'm late for work?
That isn't any crime.
It's springtime in the country,
and it's turtle-totin' time!